Pioneer sound.vision.soul

Service Manual

ORDER NO.
CRT4025

CD RECEIVER

DEH-P390MP/XS/UC
DEH-P3900MP/XS/UC

This service manual should be used together with the following manual(s) listed below. For the parts numbers, adjustments, etc. which are not shown in this manual, refer to the following manual(s).

Model No.	Order No.	Mech. Module	Remarks
DEH-P390MP/XU/UC	CRT3816		
CX-3195	CRT3815	S10.5COMP2	CD Mech. Module:Circuit Descriptions, Mech. Descriptions, Disassembly

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936
ⓒ**PIONEER CORPORATION 2007**
K-ZZD. SEPT. 2007 Printed in Japan

SAFETY INFORMATION

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.
Health & Safety Code Section 25249.6 - Proposition 65

EXPLODED VIEWS AND PARTS LIST

PACKING(Page 7)

PACKING SECTION PARTS LIST

Mark	No.	Description	DEH-P390MP/XU/UC	DEH-P390MP/XS/UC
	18	Carton	YHG5112	YHG5177
	19	Contain Box	YHL5100	YHL5384

Mark	No.	Description	DEH-P3900MP/XU/UC	DEH-P3900MP/XS/UC
	18	Carton	YHG5109	YHG5176
	19	Contain Box	YHL5097	YHL5383

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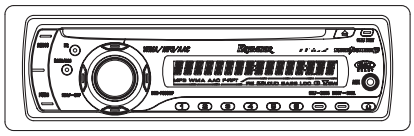
Service Manual



DEH-P390MP/XU/UC

ORDER NO.
CRT3816

CD RECEIVER

DEH-P390MP/XU/UC
DEH-P3900MP/XU/UC

This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech.Module	Remarks
CX-3195	CRT3815	S10.5COMP2	CD Mech. Module : Circuit Descriptions, Mech. Descriptions, Disassembly

For details, refer to "Important Check Points for Good Servicing".

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
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ⓒ**PIONEER CORPORATION 2006**

K-ZZA. OCT. 2006 Printed in Japan

SAFETY INFORMATION

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.
Health & Safety Code Section 25249.6 - Proposition 65

● **Safety Precautions for those who Service this Unit.**

- When checking or adjusting the emitting power of the laser diode exercise caution in order to get safe, reliable results.

Caution:

1. During repair or tests, minimum distance of 13 cm from the focus lens must be kept.
2. During repair or tests, do not view laser beam for 10 seconds or longer.

● **Service Precaution**

1. You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.
2. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
3. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to "the DISASSEMBLY".
4. After replacing the pickup unit, be sure to check the grating.
5. Be careful in handling ICs. Some ICs such as MOS type are so fragile that they can be damaged by electrostatic induction.

COMPACT disc DIGITAL AUDIO

COMPACT disc DIGITAL AUDIO TEXT

Plays Windows Media™

[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety

Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments

To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts

Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning

For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws

To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

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1. SPECIFICATIONS

● DEH-P390MP/XU/UC

General

Power source ..... 14.4 V DC (10.8 V to 15.1 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 10.0 A
Backup current ..... 5 mA or less
Dimensions (W × H × D):
- DIN
  - Chassis ..... 178 × 50 × 162 mm (7 × 2 × 6-3/8 in.)
  - Nose ..... 188 × 58 × 14 mm (7-3/8 × 2-1/4 × 1/2 in.)
- D
  - Chassis ..... 178 × 50 × 162 mm (7 × 2 × 6-3/8 in.)
  - Nose ..... 170 × 46 × 14 mm (6-3/4 × 1-3/4 × 1/2 in.)

Weight ..... 1.3 kg (2.9 lbs)

Audio

Continuous power output is 22 W per channel minimum into 4 ohms, both channels driven 50 to 15 000 Hz with no more than 5% THD.
Maximum power output ..... 50 W × 4
50 W × 2/4 Ω + 70 W × 1/2 Ω (for subwoofer)
Load impedance ..... 4 Ω to 8 Ω × 4
4 Ω to 8 Ω × 2 + 2 Ω × 1
Preout max output level/output impedance ..... 2.2 V/1 kΩ
Equalizer (3-Band Parametric Equalizer):
- Low
  - Frequency ..... 40/80/100/160 Hz
  - Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
  - Gain ..... ±12 dB
- Mid
  - Frequency ..... 200/500/1k/2k Hz
  - Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
  - Gain ..... ±12 dB
- High
  - Frequency ..... 3.15k/8k/10k/12.5k Hz
  - Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
  - Gain ..... ±12 dB

Loudness contour:
- Low ..... +3.5 dB (100 Hz), +3 dB (10 kHz)
- Mid ..... +10 dB (100 Hz), +6.5 dB (10 kHz)
- High ..... +11 dB (100 Hz), +11 dB (10 kHz) (volume: –30 dB)

HPF:
- Frequency ..... 50/63/80/100/125 Hz
- Slope ..... –12 dB/oct

Subwoofer:
- Frequency ..... 50/63/80/100/125 Hz
- Slope ..... –18 dB/oct
- Gain ..... +6 dB to –24 dB
- Phase ..... Normal/Reverse

Bass boost:
- Gain ..... +12 dB to 0 dB

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format:
- Sampling frequency ..... 44.1 kHz
- Number of quantization bits ..... 16; linear

Frequency characteristics ..... 5 Hz to 20 000 Hz (±1 dB)
Signal-to-noise ratio ..... 94 dB (1 kHz) (IHF-A network)
Dynamic range ..... 92 dB (1 kHz)
Number of channels ..... 2 (stereo)
MP3 decoding format ..... MPEG-1 & 2 Audio Layer 3
WMA decoding format ..... Ver. 7, 7.1, 8, 9, 10 (2ch audio) (Windows Media Player)
AAC decoding format ..... MPEG-4 AAC (iTunes® encoded only)
WAV signal format ..... Linear PCM & MS ADPCM

FM tuner

Frequency range ..... 87.9 MHz to 107.9 MHz
Usable sensitivity ..... 8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
Signal-to-noise ratio ..... 75 dB (IHF-A network)
Distortion ..... 0.3 % (at 65 dBf, 1 kHz, stereo) 0.1 % (at 65 dBf, 1 kHz, mono)
Frequency response ..... 30 Hz to 15 000 Hz (±3 dB)
Stereo separation ..... 45 dB (at 65 dBf, 1 kHz)

AM tuner

Frequency range ..... 530 kHz to 1 710 kHz (10 kHz)
Usable sensitivity ..... 18 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IHF-A network)

Note

Specifications and the design are subject to possible modifications without notice due to improvements. ■

● DEH-P3900MP/XU/UC

General

Power source ..... 14.4 V DC (10.8 V to 15.1 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 10.0 A
Backup current ..... 5 mA or less
Dimensions (W × H × D):
DIN
Chassis ..... 178 × 50 × 162 mm (7 × 2 × 6-3/8 in.)
Nose ..... 188 × 58 × 14 mm (7-3/8 × 2-1/4 × 1/2 in.)
D
Chassis ..... 178 × 50 × 162 mm (7 × 2 × 6-3/8 in.)
Nose ..... 170 × 46 × 14 mm (6-3/4 × 1-3/4 × 1/2 in.)
Weight ..... 1.3 kg (2.9 lbs)

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Continuous power output is 22 W per channel minimum into 4 ohms, both channels driven 50 to 15 000 Hz with no more than 5% THD.
Maximum power output ..... 50 W × 4
50 W × 2/4 Ω + 70 W × 1/2 Ω (for subwoofer)
Load impedance ..... 4 Ω to 8 Ω × 4
4 Ω to 8 Ω × 2 + 2 Ω × 1
Preout max output level/output impedance ..... 2.2 V/1 kΩ
Equalizer (3-Band Parametric Equalizer):
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Frequency ..... 40/80/100/160 Hz
Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
Gain ..... ±12 dB
Mid
Frequency ..... 200/500/1k/2k Hz
Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
Gain ..... ±12 dB
High
Frequency ..... 3.15k/8k/10k/12.5k Hz
Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
Gain ..... ±12 dB
Loudness contour:
Low ..... +3.5 dB (100 Hz), +3 dB (10 kHz)
Mid ..... +10 dB (100 Hz), +6.5 dB (10 kHz)
High ..... +11 dB (100 Hz), +11 dB (10 kHz) (volume: –30 dB)
HPF:
Frequency ..... 50/63/80/100/125 Hz
Slope ..... –12 dB/oct
Subwoofer:
Frequency ..... 50/63/80/100/125 Hz
Slope ..... –18 dB/oct
Gain ..... +6 dB to –24 dB
Phase ..... Normal/Reverse
Bass boost:
Gain ..... +12 dB to 0 dB

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format:
Sampling frequency ..... 44.1 kHz
Number of quantization bits ..... 16; linear
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Signal-to-noise ratio ..... 94 dB (1 kHz) (IHF-A network)
Dynamic range ..... 92 dB (1 kHz)
Number of channels ..... 2 (stereo)
MP3 decoding format ..... MPEG-1 & 2 Audio Layer 3
WMA decoding format ..... Ver. 7, 7.1, 8, 9, 10 (2ch audio) (Windows Media Player)
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Distortion ..... 0.3 % (at 65 dBf, 1 kHz, stereo) 0.1 % (at 65 dBf, 1 kHz, mono)
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AM tuner

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Usable sensitivity ..... 18 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IHF-A network)

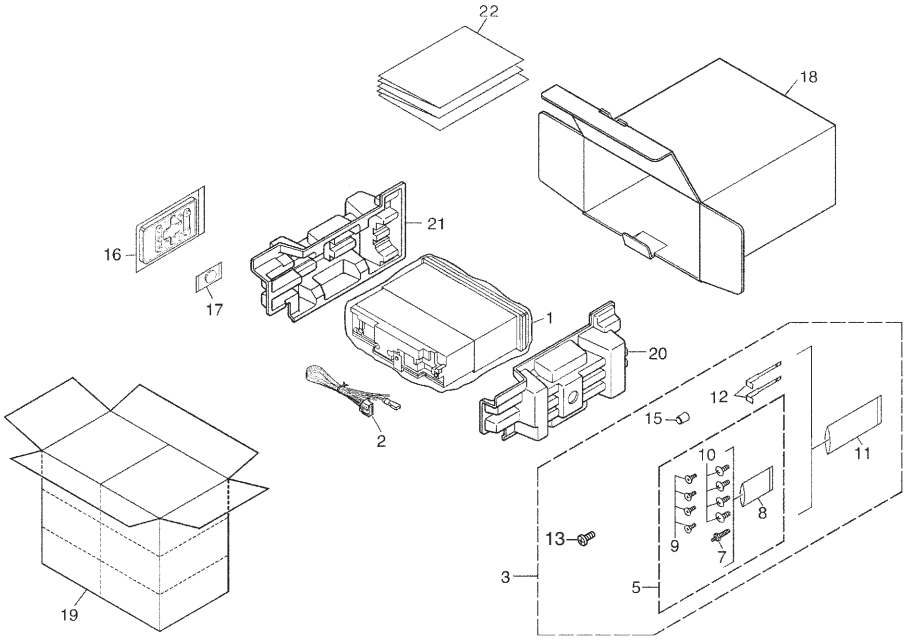
Note

Specifications and the design are subject to possible modifications without notice due to improvements. ■

2. EXPLODED VIEWS AND PARTS LIST

*NOTES : • Parts marked by " * " are generally unavailable because they are not in our Master Spare Parts List.*
• The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
• Screw adjacent to▽mark on the product are used for disassembly.
• For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions,apply as you think it appropriate.)

2.1 PACKING



PACKING SECTION PARTS LIST

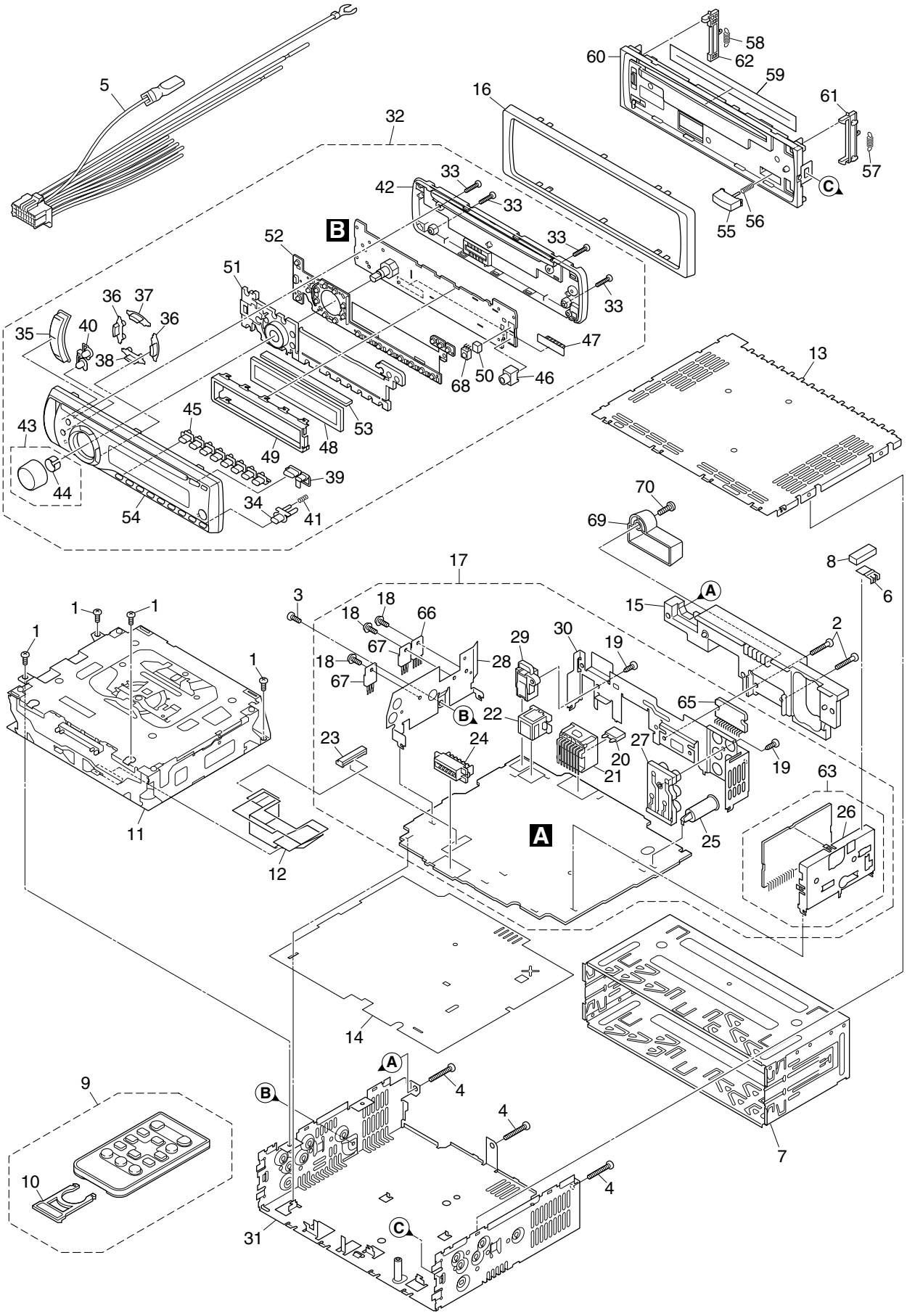
Mark	No.	Description	Part No.
	1	Polyethylene Bag	CEG1173
	2	Cord Assy	CDP1017
	3	Accessory Assy	YEA5012
	4	•••••	
	5	Screw Assy	CEA3849
	6	•••••	
	7	Screw	CBA1650
*	8	Polyethylene Bag	CEG-127
	9	Screw	CRZ50P090FTC
	10	Screw	TRZ50P080FTC
*	11	Polyethylene Bag	CEG-158
	12	Handle	CND3707
	13	Screw	BPZ20P080FTC
	14	•••••	
	15	Bush	CNV3930
	16	Remote Control Assy	CXC5719

Mark	No.	Description	Part No.
*	17	Battery	CEX1065
	18	Carton(P390MP)	YHG5112
		Carton(P3900MP)	YHG5109
	19	Contain Box(P390MP)	YHL5100
		Contain Box(P3900MP)	YHL5097
	20	Protector	YHP5008
	21	Protector	YHP5009
	22-1	Owner's Manual(P390MP)	YRD5075
		Owner's Manual(P3900MP)	YRD5073
	22-2	Installation Manual(P390MP)	YRD5076
		Installation Manual(P3900MP)	YRD5074
	22-3	Caution Card	CRP1310
*	22-4	Warranty Card(P390MP)	CRY1070
*		Warranty Card(P3900MP)	CRY1246
	22-5	Caution Card(P3900MP)	CRP1294

Owner's Manual,Installation Manual

Part No.	Language
YRD5075,YRD5076, YRD5073,YRD5074	English, French, Spanish

2.2 EXTERIOR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(1) EXTERIOR SECTION PARTS LIST

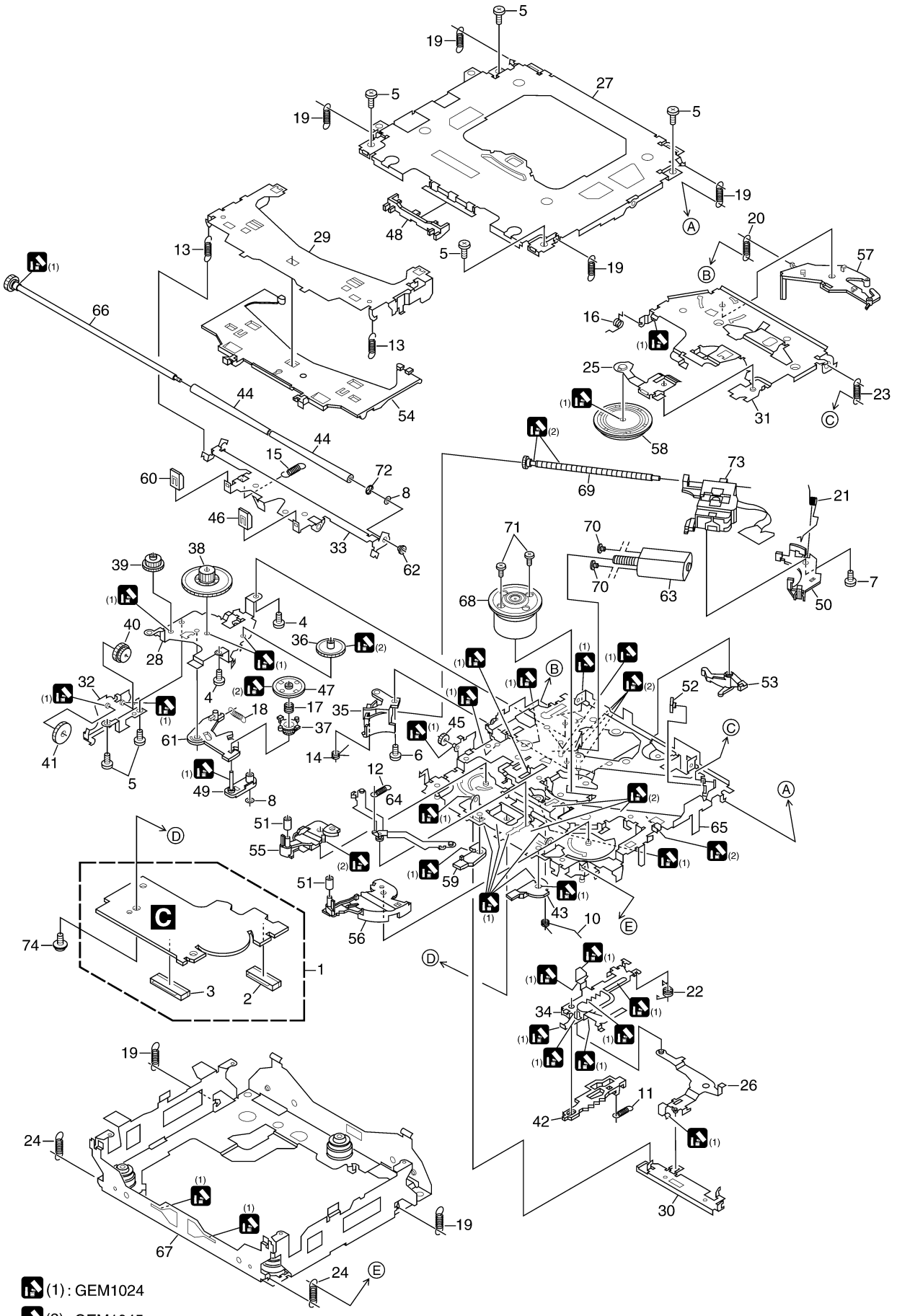
Mark	No.	Description	Part No.
	1	Screw	BSZ26P060FTC
	2	Screw	BSZ26P200FTC
	3	Screw	BSZ30P060FTC
	4	Screw	BSZ30P200FTC
	5	Cord Assy	CDP1017
	6	Earth Plate	CNC8915
	7	Holder	CND3598
	8	Cushion	CNM8890
	9	Remote Control Assy	CXC5719
	10	Cover	CNS7068
	11	CD Mechanism Module(S10.5)	CXK5760
	12	Cable	YDE5025
	13	Case	YNB5014
	14	Insulator	YNM5062
	15	Heat Sink	YNR5031
	16	Panel	See Contrast table(2)
	17	Tuner Amp Unit	See Contrast table(2)
	18	Screw	BSZ26P060FTC
	19	Screw	BPZ26P080FTC
⚠	20	Fuse(10 A)	CEK1208
	21	Plug(CN901)	CKM1376
	22	Connector(CN101)	CKS3408
	23	Connector(CN701)	CKS3829
	24	Connector(CN803)	CKS5664
	25	Antenna Jack(CN401)	CKX1056
	26	Holder	CND1054
	27	Pin Jack(CN351)	XKB7001
	28	Holder	XNC7030
	29	Jack(CN621)	YKS5002
	30	Holder	YNC5039
	31	Chassis Unit	YXA5196
	32	Detachable Assy	See Contrast table(2)
	33	Screw	BPZ20P100FTB
	34	Button(Detach)	CAC9941
	35	Button(AUDIO/FUNC)	CAC9942
	36	Button(L/R)	CAC9946
	37	Button(UP)	CAC9947
	38	Button(DOWN)	CAC9948
	39	Button(EJECT)	CAC9949
	40	Button(EQ/BAND)	CAC9950
	41	Spring	CBH2210
	42	Cover	CNS8758
	43	Knob Unit(SOURCE,VOLUME)	CXC7054
	44	Spring	CBL1761
	45	Button(1-6)	See Contrast table(2)
	46	Jack	CKN1047
	47	Connector(CN1801)	CKS5663
	48	LCD(LCD1801)	YAW5080
	49	Holder	YNC5025
	50	Cushion	YNM5029
	51	Lighting Conductor	YNV5066
	52	Rubber	YNV5067
	53	Connector	YNV5068
	54	Grille Unit	See Contrast table(2)
	55	Button(DETACH)	CAC4836
	56	Spring	CBH2367
	57	Spring	CBH2961
	58	Spring	CBH2962
	59	Cover	CNN1665
	60	Panel	CNS8760
	61	Arm	CNV9311
	62	Arm	CNV9312
	63	FM/AM Tuner Unit	CWE1952
	64	•••••	
	65	IC(IC301)	PAL007C
	66	IC(IC921)	NJM2388F84
	67	Transistor (Q702,Q911)	2SD2396
	68	IC(IC1802)	GP1UX51RK
	69	Holder	See Contrast table(2)
	70	Screw	See Contrast table(2)

(2) CONTRAST TABLE

DEH-P390MP/XU/UC and DEH-P3900MP/XU/UC are constructed the same except for the following:

Mark	No.	Description	DEH-P390MP/XU/UC	DEH-P3900MP/XU/UC
	16	Panel	YNS5191	YNS5190
	17	Tuner Amp Unit	YWM5137	YWM5139
	32	Detachable Assy	YXA5205	YXA5206
	45	Button(1-6)	YAC5118	CAC9943
	54	Grille Unit	YXA5232	YXA5197
	69	Holder	Not used	CNV7619
	70	Screw	Not used	BMZ40P140FTC

2.3 CD MECHANISM MODULE

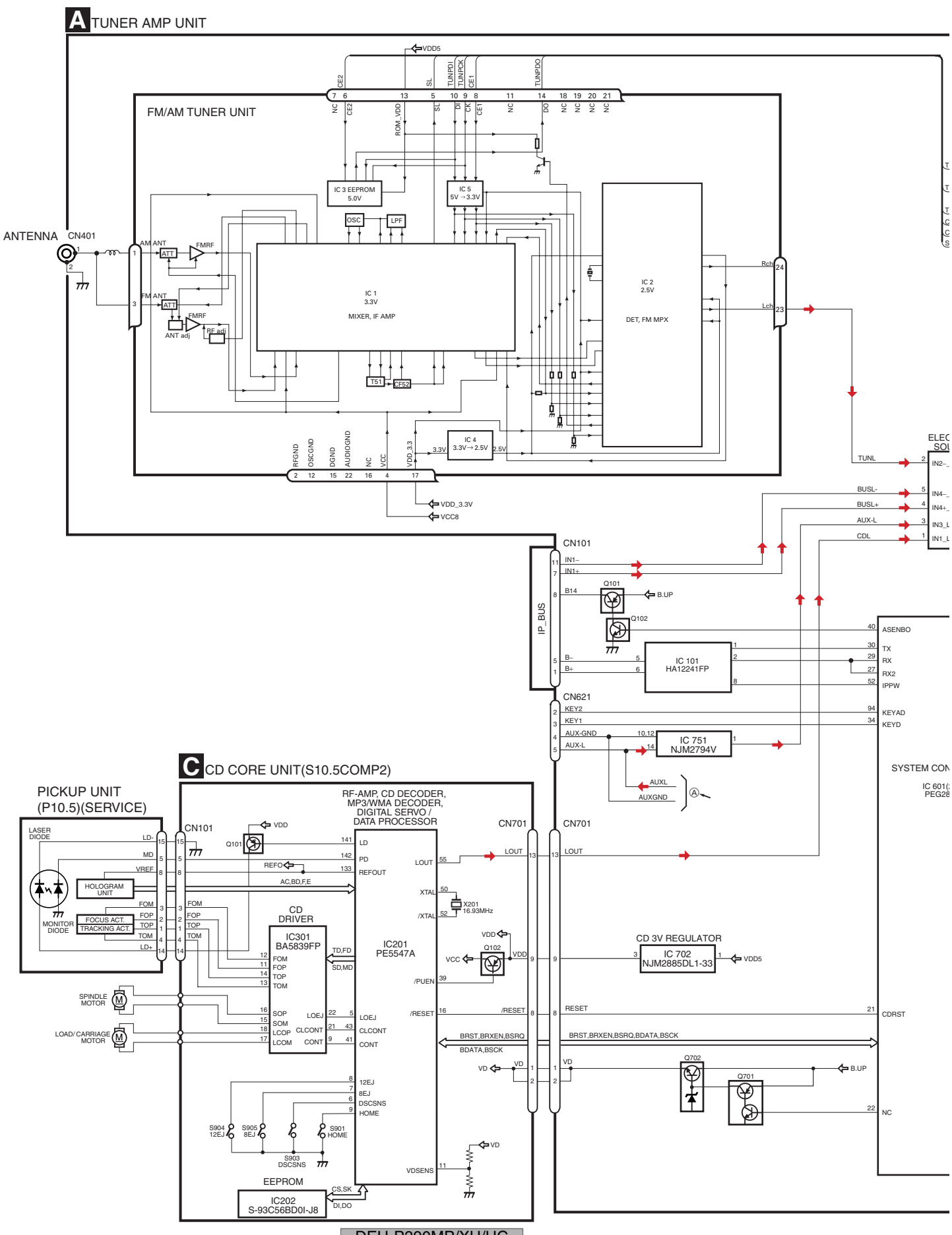


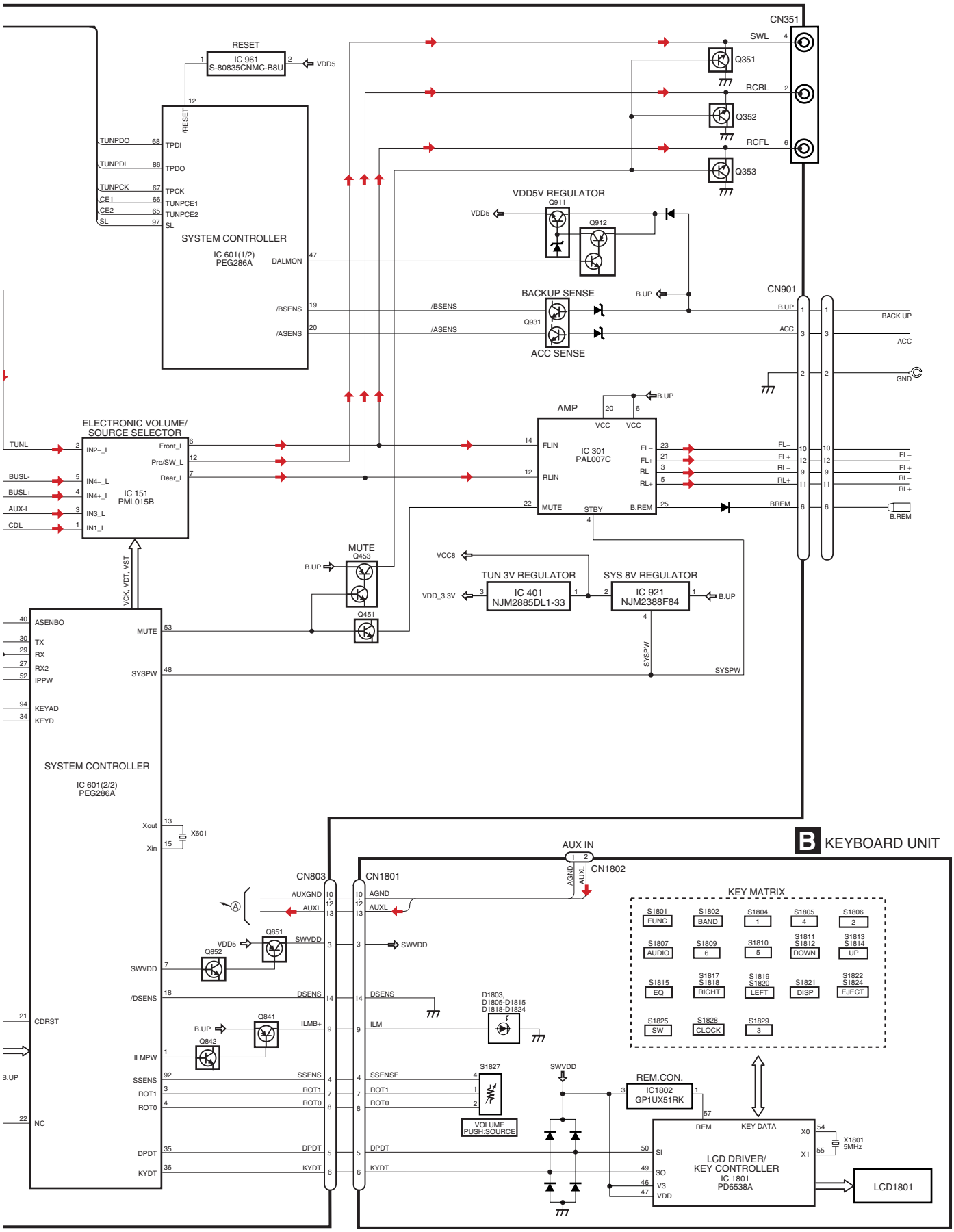
CD MECHANISM MODULE SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	CD Core Unit(S10.5COMP2)	CWX3350
	2	Connector(CN101)	CKS4911
	3	Connector(CN701)	CKS4808
	4	Screw	BMZ20P025FTC
	5	Screw	BSZ20P040FTC
	6	Screw(M2 x 3)	CBA1511
	7	Screw(M2 x 4)	CBA1835
	8	Washer	CBF1038
	9	•••••	
	10	Spring	CBH2609
	11	Spring	CBH2612
	12	Spring	CBH2614
	13	Spring	CBH2616
	14	Spring	CBH2617
	15	Spring	CBH2620
	16	Spring	CBH2855
	17	Spring	CBH2937
	18	Spring	CBH2735
	19	Spring	CBH2854
	20	Spring	CBH2642
	21	Spring	CBH2856
	22	Spring	CBH2857
	23	Spring	CBH2860
	24	Spring	CBH2861
	25	Spring	CBL1686
	26	Arm	CND1909
	27	Frame	CND2582
	28	Bracket	CND2583
	29	Arm	CND2584
	30	Lever	CND2585
	31	Arm	CND2586
	32	Bracket	CND2587
	33	Arm	CND2588
	34	Lever	CND2589
	35	Holder	CNV7201
	36	Gear	CNV7207
	37	Gear	CNV7208
	38	Gear	CNV7209
	39	Gear	CNV7210
	40	Gear	CNV7211
	41	Gear	CNV7212
	42	Rack	CNV7214
	43	Arm	CNV7216
	44	Roller	CNV8189
	45	Gear	CNV7219
	46	Guide	CNV7361
	47	Gear	CNV7595
	48	Guide	CNV8448
	49	Arm	CNV7805
	50	Rack	CNV8342
	51	Roller	CNV8343
	52	Holder	CNV8344
	53	Arm	CNV8345
	54	Guide	CNV8347
	55	Arm	CNV8348
	56	Arm	CNV8349
	57	Arm	CNV8350
	58	Clamper	CNV8365
	59	Arm	CNV8386
	60	Guide	CNV8396
	61	Arm	CNV8413
	62	Collar	CNV8447
	63	Motor Unit(M2)	CXC4026
	64	Arm Unit	CXC4027
	65	Chassis Unit	CXC4028
	66	Gear Unit	CXC4029
	67	Frame Unit	CXC4031
	68	Motor Unit(M1)	CXC7134
	69	Screw Unit	CXC6359
	70	Screw	JFZ20P020FTC
	71	Screw	JGZ17P022FTC
	72	Washer	YE20FTC
	73	Pickup Unit(P10.5)(Service)	CXX1942
	74	Screw	IMS26P030FTC

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

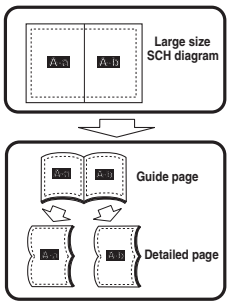
3.1 BLOCK DIAGRAM

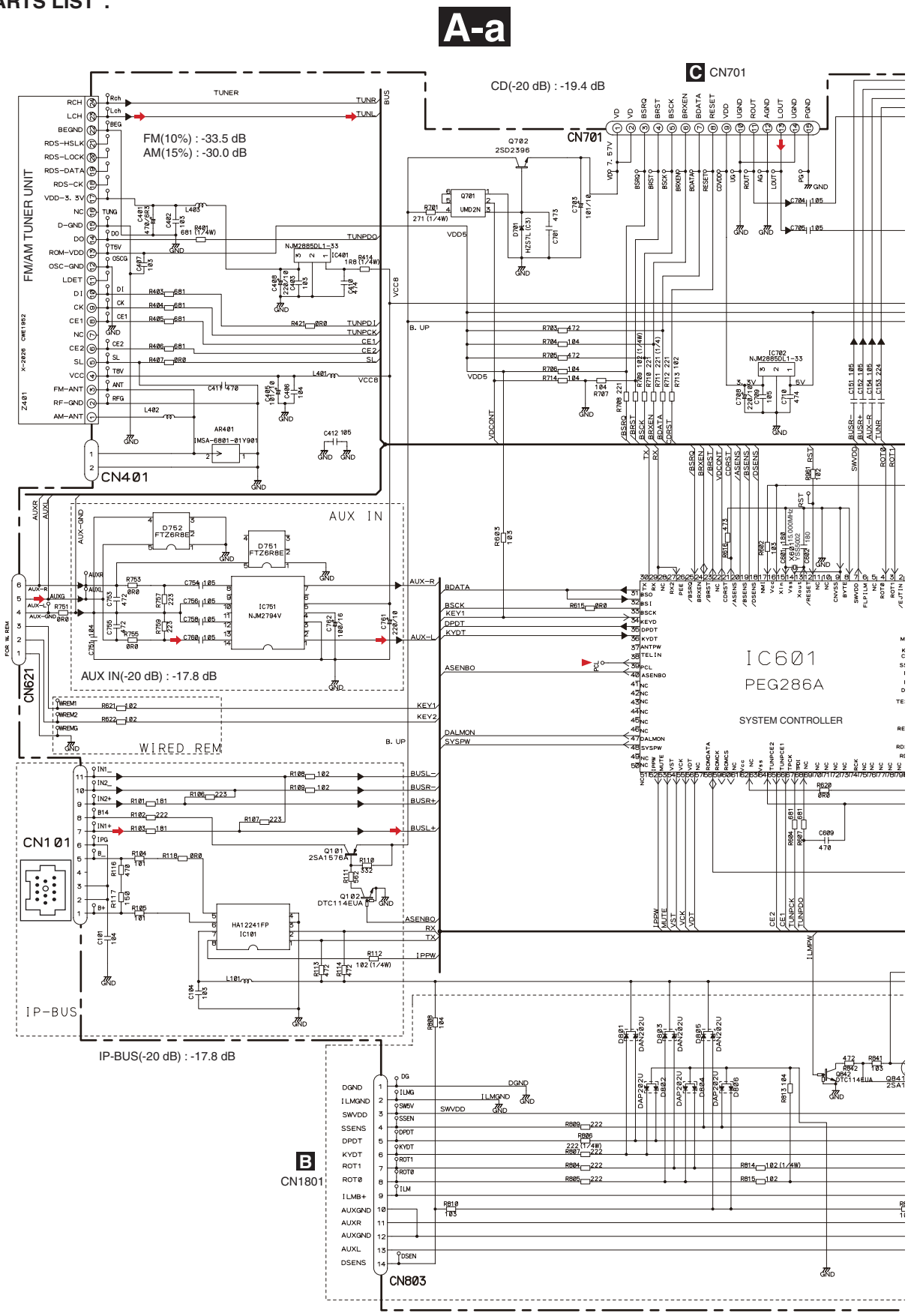



CN351
SWL
RCRL
RCFL
Q351
Q352
Q353
RESET
IC 961
S-80835CNMC-B8U
VDD5
/RESET
TUNPDO
TUNPDI
TUNPCK
CE1
CE2
SL
TPDI
TPDO
TPCK
TUNPCE1
TUNPCE2
SL
SYSTEM CONTROLLER
IC 601(1/2)
PEG286A
DALMON
VDD5V REGULATOR
Q911
Q912
BACKUP SENSE
Q931
ACC SENSE
/BSENS
/ASENS
B.UP
CN901
BACK UP
ACC
GND
B.REM
ELECTRONIC VOLUME/
SOURCE SELECTOR
IC 151
PML015B
TUNL
BUSL-
BUSL+
AUX-L
CDL
Front_L
Pre/SW_L
Rear_L
AMP
IC 301
PAL007C
FLIN
RLIN
MUTE
STBY
B.REM
VCC
FL–
FL+
RL–
RL+
BREM
MUTE
Q453
Q451
TUN 3V REGULATOR
IC 401
NJM2885DL1-33
VDD_3.3V
SYS 8V REGULATOR
IC 921
NJM2388F84
VCC8
SYSPW
VCK, VDT, VST
SYSTEM CONTROLLER
IC 601(2/2)
PEG286A
ASENBO
TX
RX
RX2
IPPW
KEYAD
KEYD
CDRST
NC
Xout
Xin
X601
AUX IN
CN803
CN1801
CN1802
AUXGND
AUXL
AGND
SWVDD
Q851
Q852
DSENS
/DSENS
ILMB+
ILMPW
Q841
Q842
SSENS
ROT1
ROT0
DPDT
KYDT
D1803,
D1805-D1815
D1818-D1824
S1827
VOLUME
PUSH:SOURCE
REM.CON.
IC1802
GP1UX51RK
REM
KEY DATA
LCD DRIVER/
KEY CONTROLLER
IC 1801
PD6538A
X1801
5MHz
LCD1801
B KEYBOARD UNIT
KEY MATRIX
S1801 FUNC
S1802 BAND
S1804 1
S1805 4
S1806 2
S1807 AUDIO
S1809 6
S1810 5
S1811 S1812 DOWN
S1813 S1814 UP
S1815 EQ
S1817 S1818 RIGHT
S1819 S1820 LEFT
S1821 DISP
S1822 S1824 EJECT
S1825 SW
S1828 CLOCK
S1829 3

3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

Note: When ordering service parts, be sure to refer to " EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".



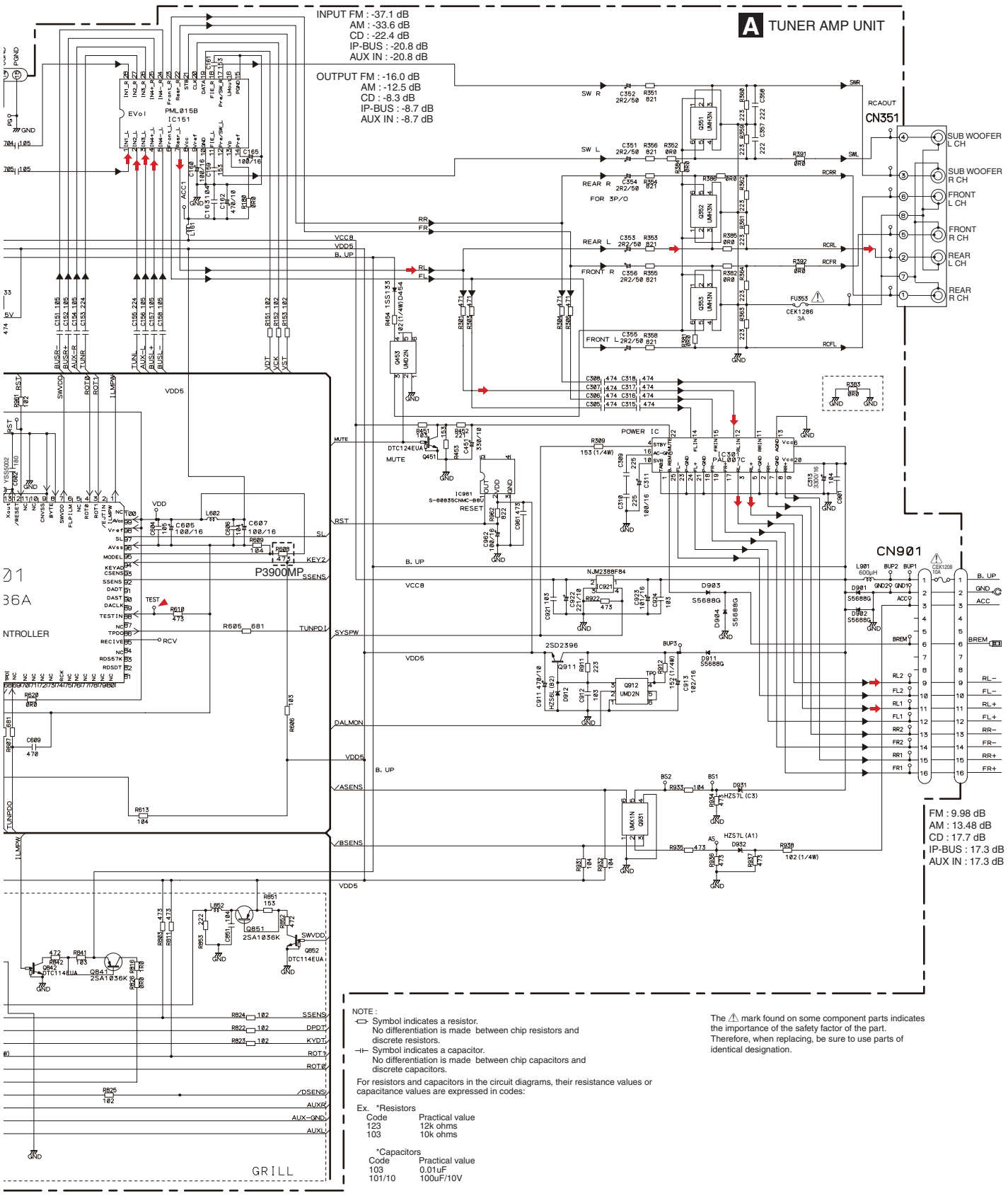


A-b

A TUNER AMP UNIT

INPUT FM : -37.1 dB
AM : -33.6 dB
CD : -22.4 dB
IP-BUS : -20.8 dB
AUX IN : -20.8 dB

OUTPUT FM : -16.0 dB
AM : -12.5 dB
CD : -8.3 dB
IP-BUS : -8.7 dB
AUX IN : -8.7 dB



NOTE :
- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

Ex. *Resistors

Code	Practical value
123	12k ohms
103	10k ohms

*Capacitors

Code	Practical value
103	0.01uF
101/10	100uF/10V

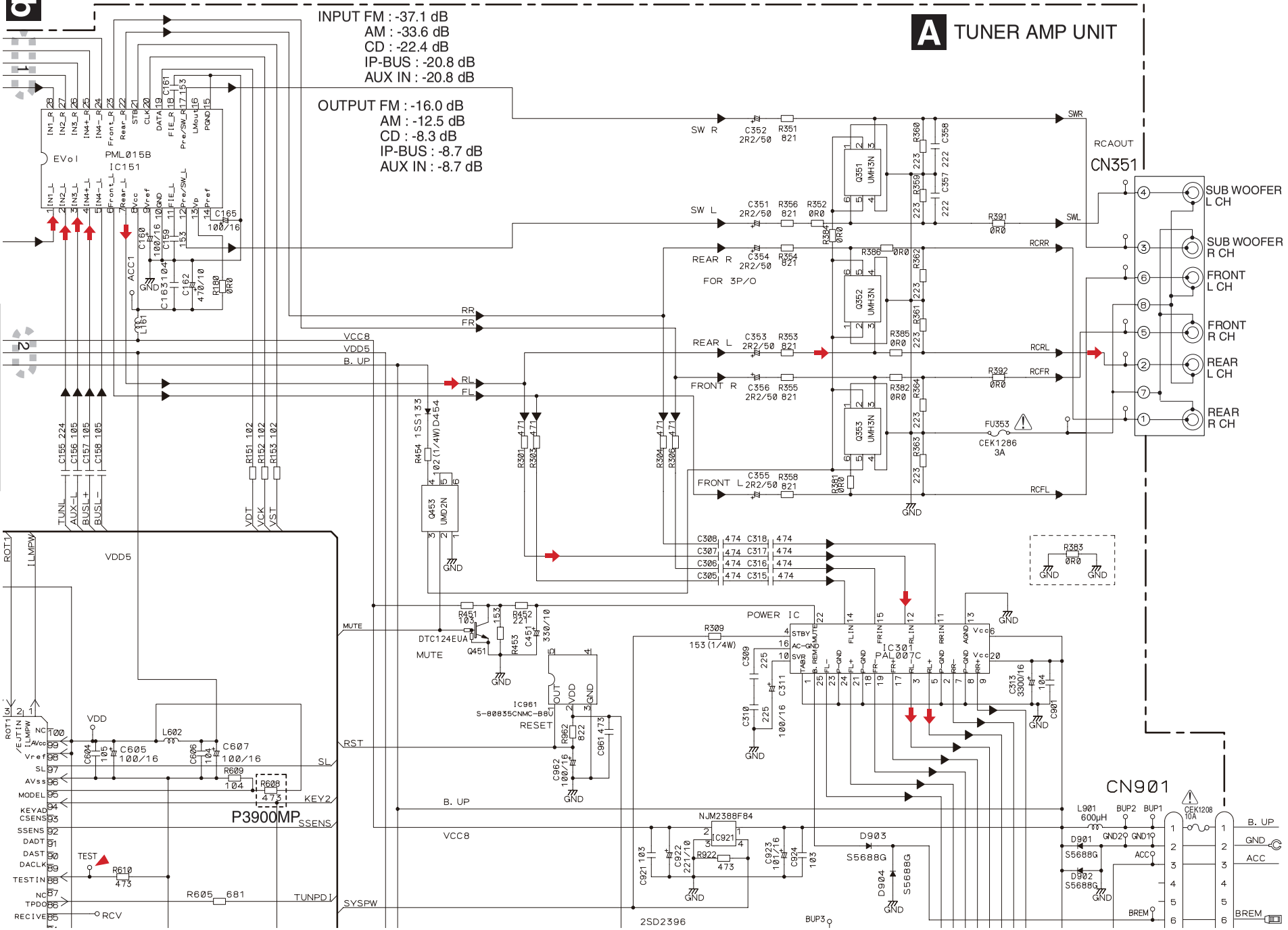
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

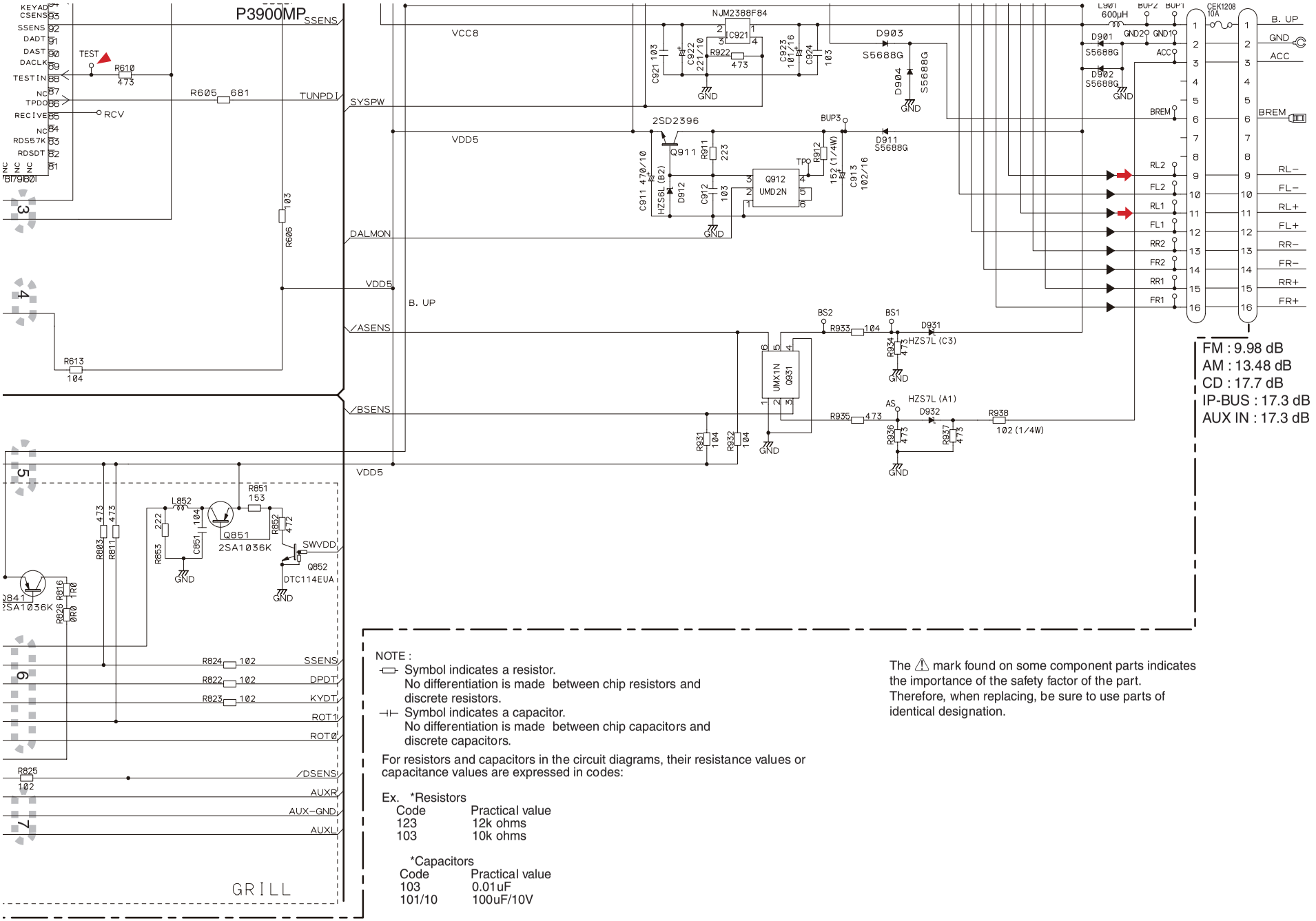
INPUT FM : -37.1 dB
AM : -33.6 dB
CD : -22.4 dB
IP-BUS : -20.8 dB
AUX IN : -20.8 dB

OUTPUT FM : -16.0 dB
AM : -12.5 dB
CD : -8.3 dB
IP-BUS : -8.7 dB
AUX IN : -8.7 dB

A TUNER AMP UNIT

DEH-P390MP/XU/UC





NOTE :

- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

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123	12k ohms
103	10k ohms

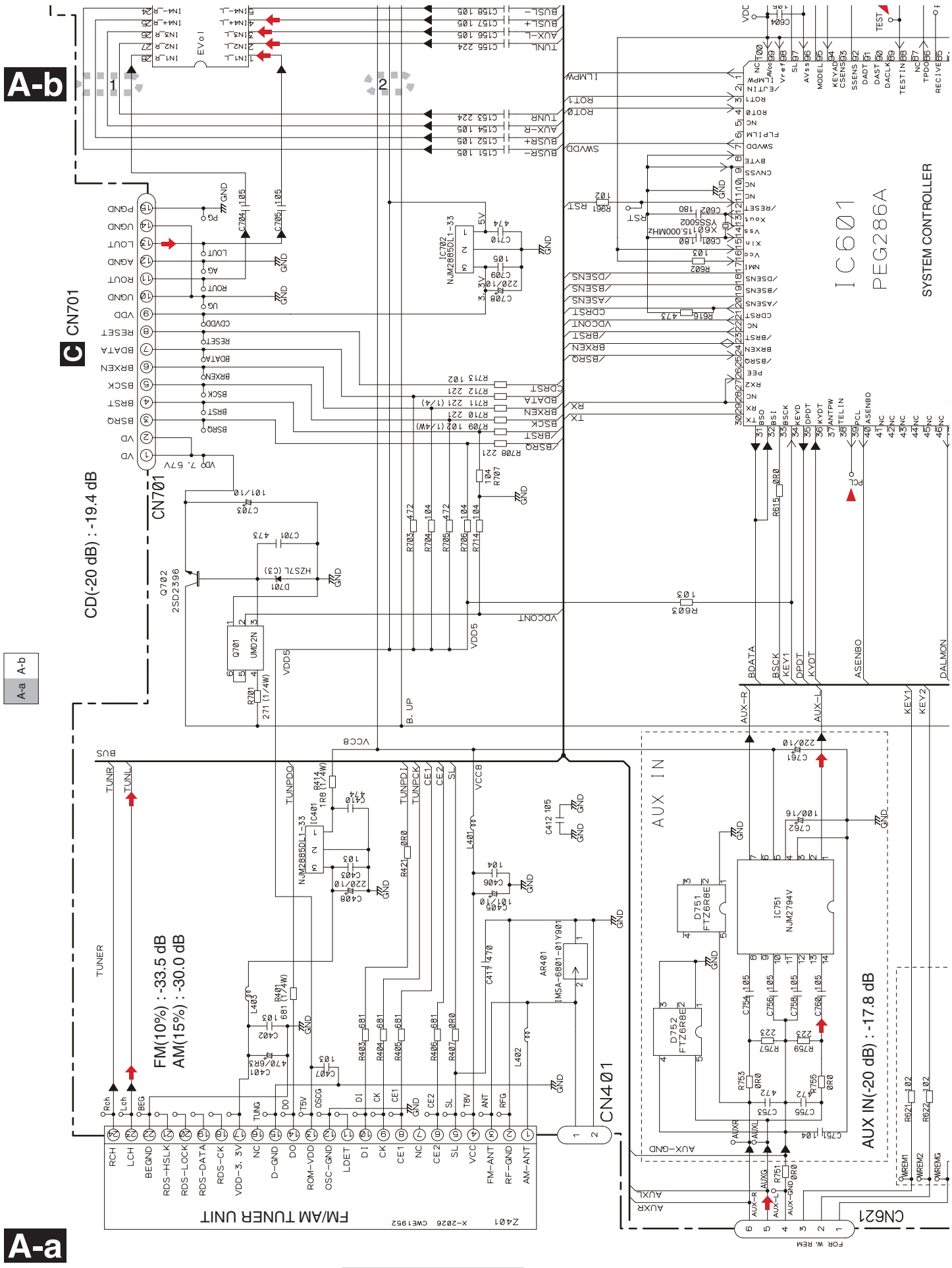
*Capacitors

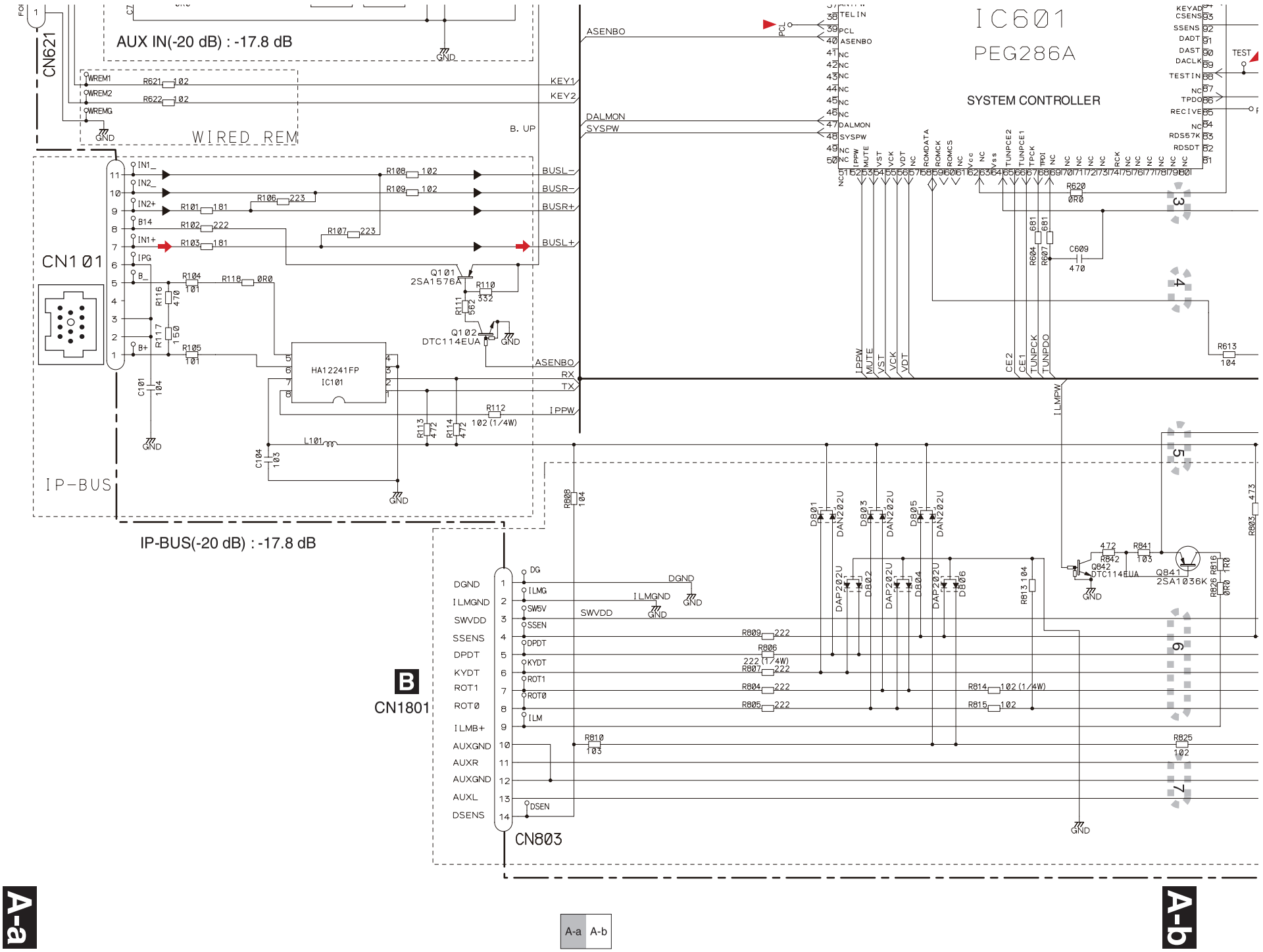
Code	Practical value
103	0.01uF
101/10	100uF/10V

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

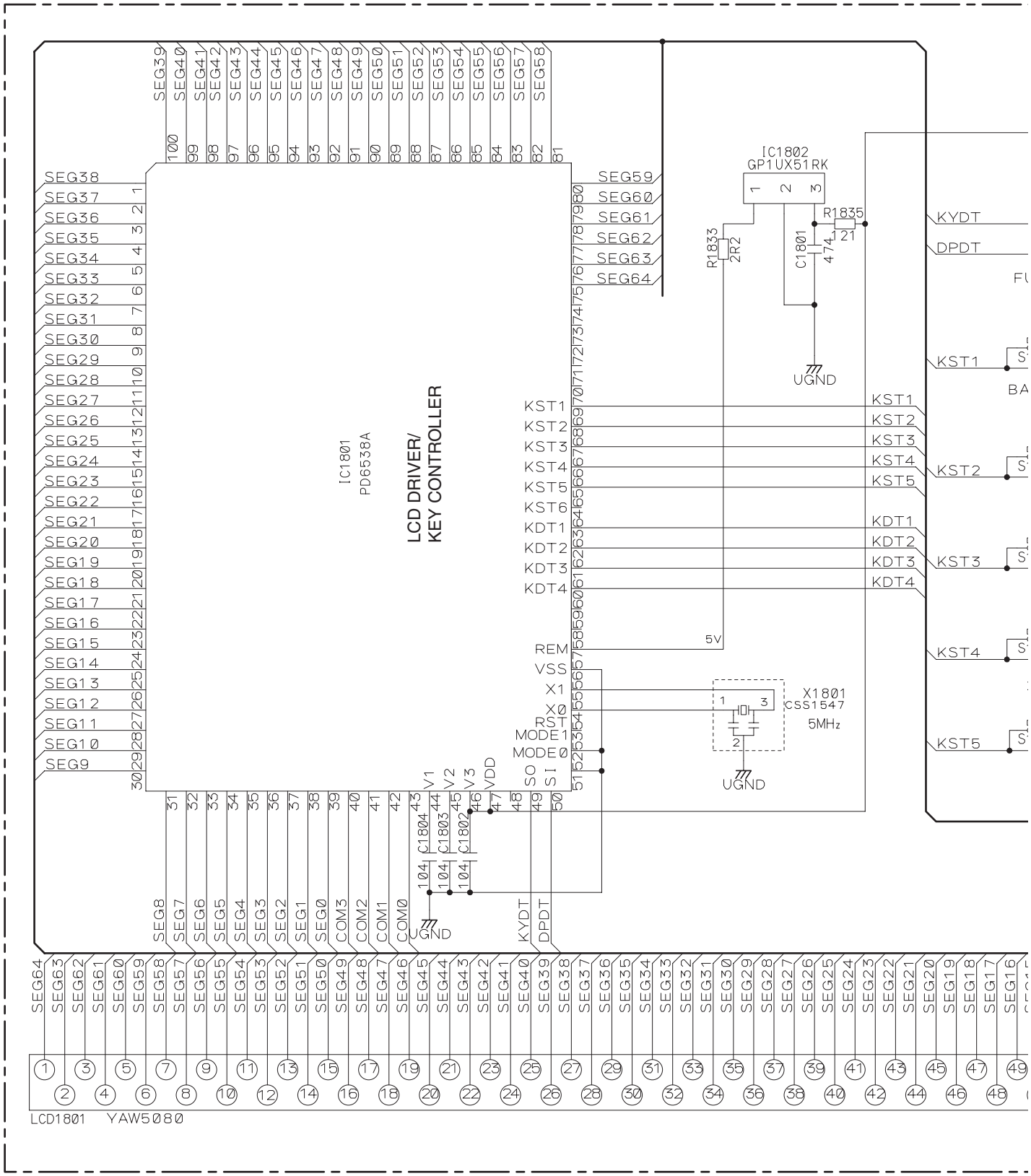
A-b

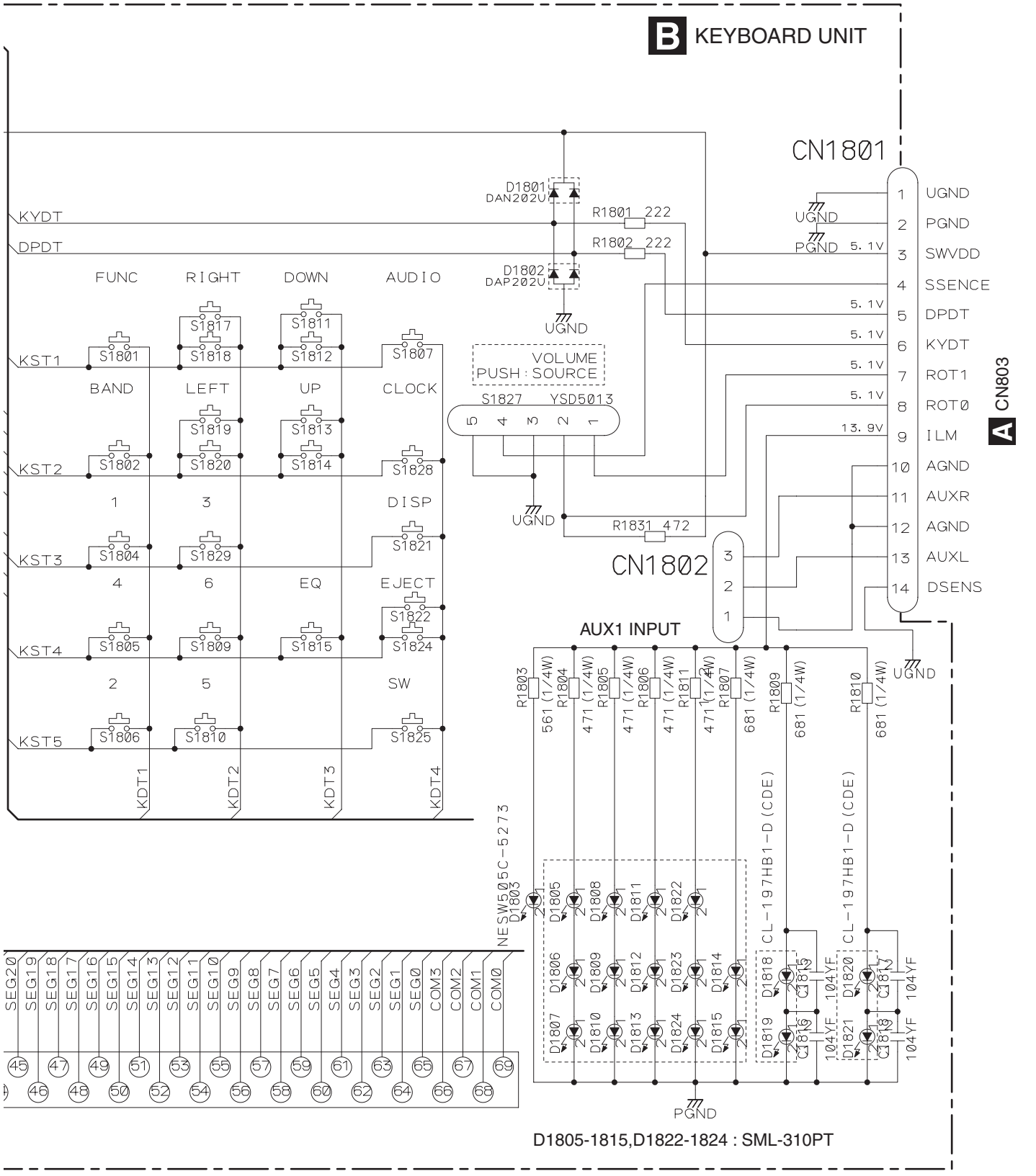
A-a | A-b


A-b
A-a
SYSTEM CONTROLLER
IC601
PEG286A
CN701
CD(-20 dB) : -19.4 dB
FM(10%) : -33.5 dB
AM(15%) : -30.0 dB
TUNER
AUX IN
AUX IN(-20 dB) : -17.8 dB
CN401
CN621
FM/AM TUNER UNIT
Z401
FOR W. REM
DEH-P390MP/XU/UC
18


AUX IN(-20 dB) : -17.8 dB
CN621
WIRED REM
CWREM1
CWREM2
CWREMG
R621 102
R622 102
KEY1
KEY2
B. UP
ASENBO
DALMON
SYSPW
IC601
PEG286A
SYSTEM CONTROLLER
CN101
IP-BUS
IP-BUS(-20 dB) : -17.8 dB
HA12241FP
IC101
Q101
2SA1576A
Q102
DTC114EUA
BUSL-
BUSR-
BUSR+
BUSL+
RX
TX
IPPW
CN1801
CN803
DGND
ILMGND
SWVDD
SSENS
DPDT
KYDT
ROT1
ROT0
ILMB+
AUXGND
AUXR
AUXGND
AUXL
DSENS
Q841
2SA1036K
Q842
DTC114EUA
DAN202U
DAP202U
A-a
A-b
DEH-P390MP/XU/UC

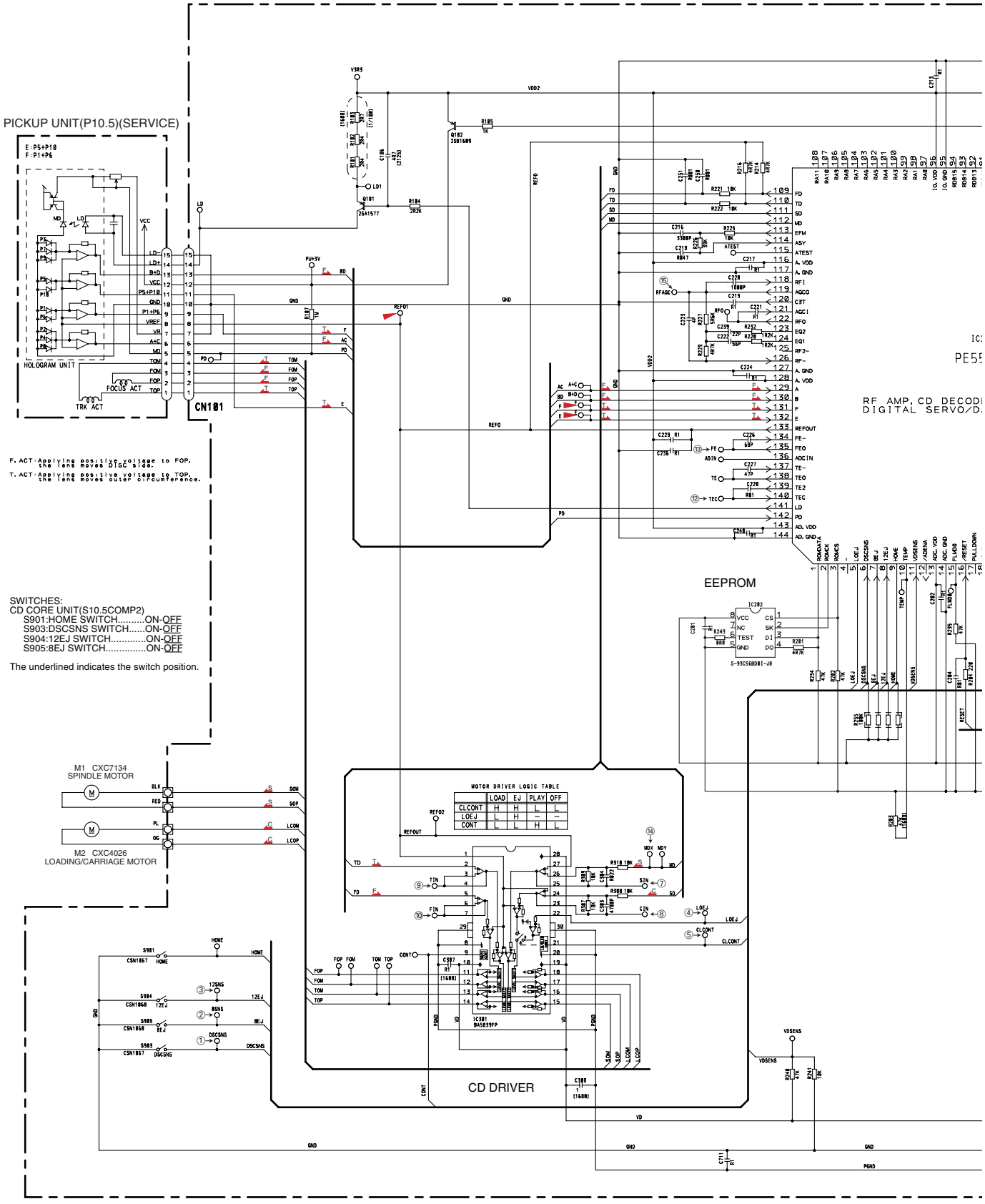
3.3 KEYBOARD UNIT




B KEYBOARD UNIT
CN1801
CN1802
CN803
A
KYDT
DPDT
FUNC
RIGHT
DOWN
AUDIO
KST1
KST2
KST3
KST4
KST5
BAND
LEFT
UP
CLOCK
DISP
EJECT
SW
KDT1
KDT2
KDT3
KDT4
D1801 DAN202U
D1802 DAP202U
R1801 222
R1802 222
R1831 472
UGND
PGND
5.1V
13.9V
VOLUME
PUSH : SOURCE
S1827 YSD5013
1 UGND
2 PGND
3 SWVDD
4 SSENCE
5 DPDT
6 KYDT
7 ROT1
8 ROT0
9 ILM
10 AGND
11 AUXR
12 AGND
13 AUXL
14 DSENS
AUX1 INPUT
NES W505C-5273
CL-197HB1-D (CDE)
104YF
SEG20
SEG19
SEG18
SEG17
SEG16
SEG15
SEG14
SEG13
SEG12
SEG11
SEG10
SEG9
SEG8
SEG7
SEG6
SEG5
SEG4
SEG3
SEG2
SEG1
SEG0
COM3
COM2
COM1
COM0
D1805-1815,D1822-1824 : SML-310PT

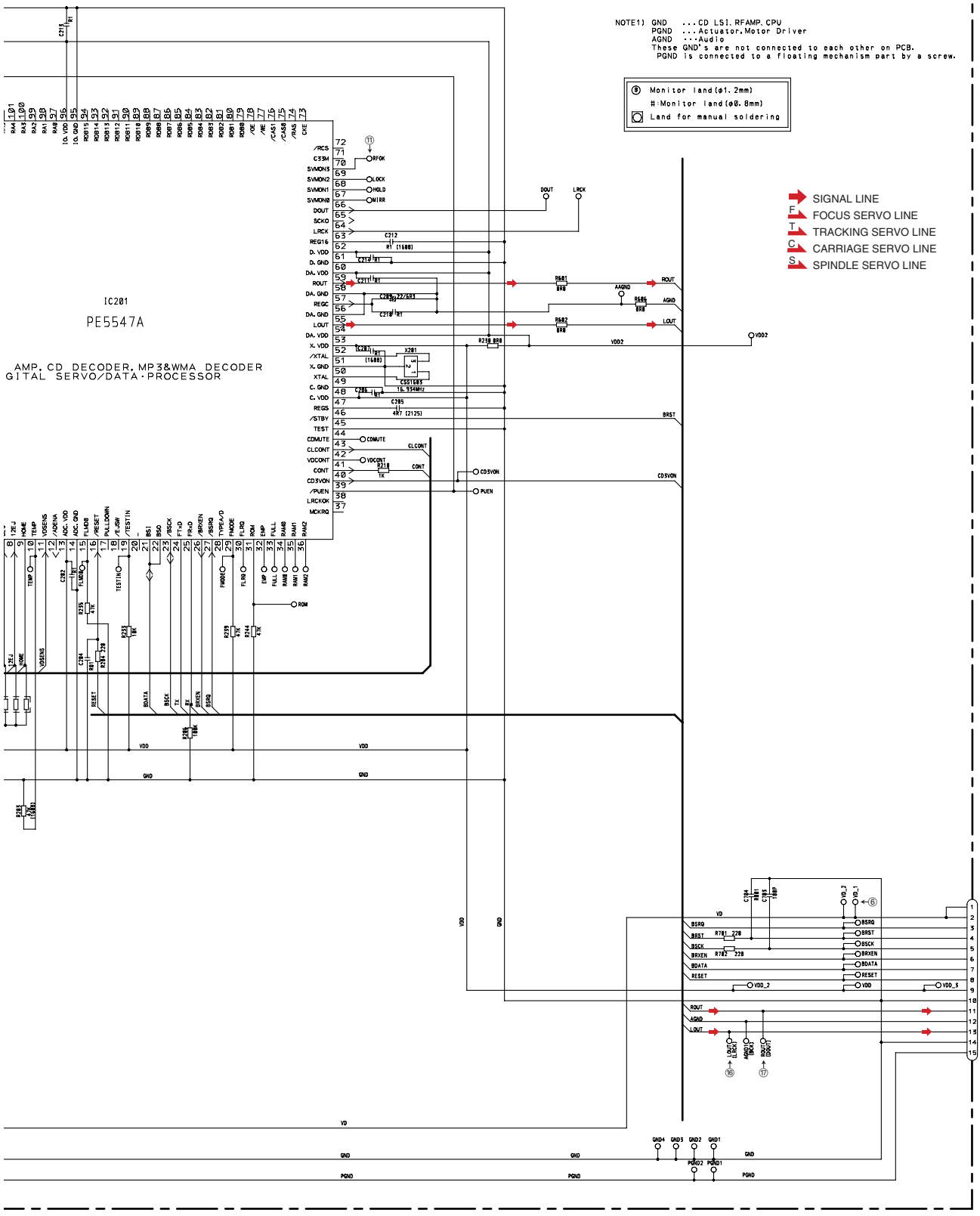
3.4 CD MECHANISM MODULE(GUIDE PAGE)

C-a



C

C CD CORE UNIT(S10.5COMP2)



A

B

C

D

E

F

C-a C-b

C CD CORE UNIT(S10.5COMP2)

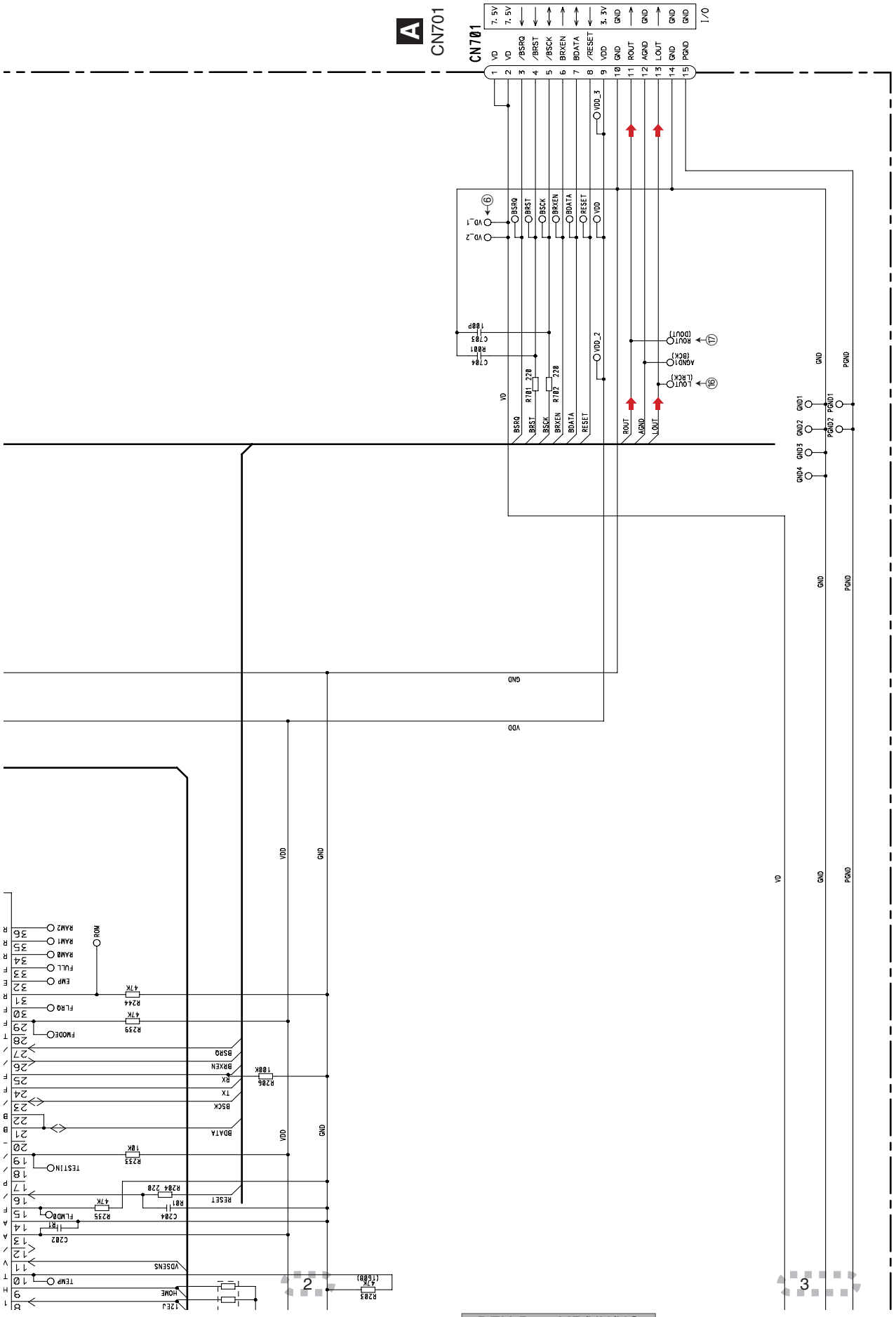
NOTE1) GND ...CD LSI,RFAMP,CPU
PGND ...Actuator,Motor Driver
AGND ...Audio
These GND's are not connected to each other on PCB.
PGND is connected to a floating mechanism part by a screw.

Ⓑ Monitor land(φ1.2mm)
#:Monitor land(φ0.8mm)
◯ Land for manual soldering

SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE

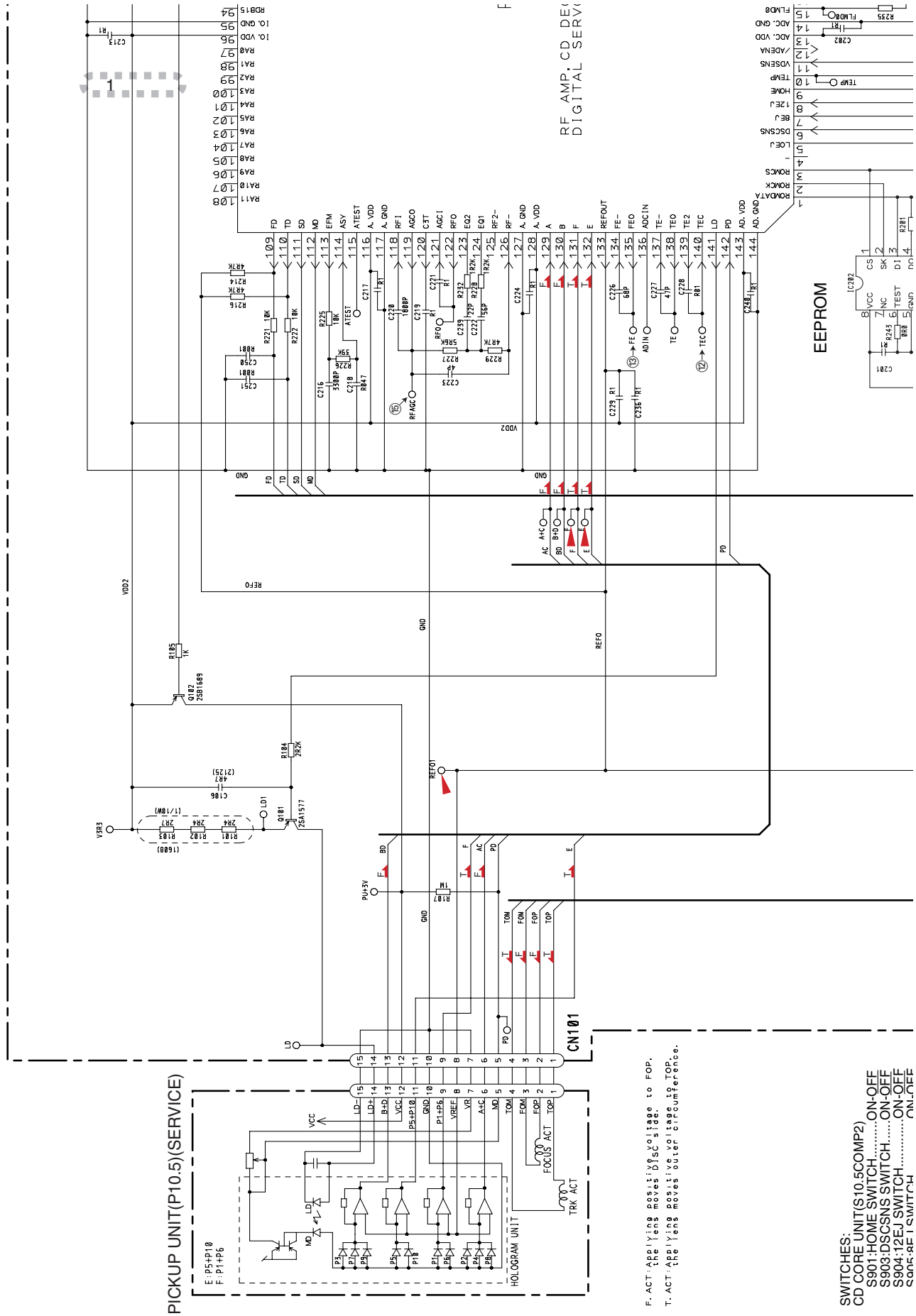
IC201
PE5547A
AMP, CD DECODER, MP3&WMA DECODER
SITAL SERVO/DATA PROCESSOR

C-b

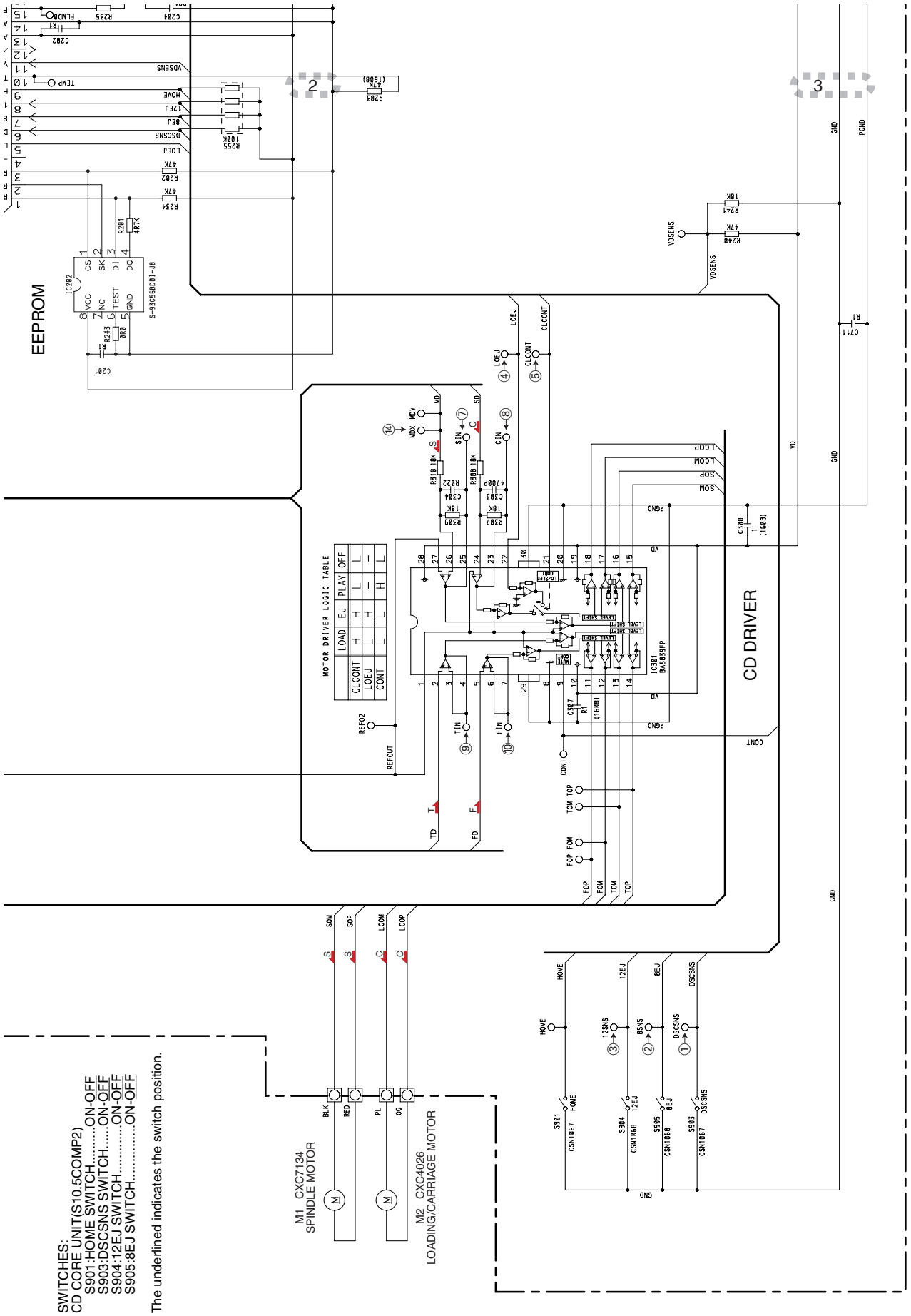

A
CN701
CN701
1/O
VD
VD
/BSRQ
/BRST
/BSCK
BRXEN
BDATA
/RESET
VDD
GND
ROUT
AGND
LOUT
GND
PGND
7.5V
7.5V
3.3V
VDD_3
VDD_2
VD_1
VD_2
BSRQ
BRST
BSCK
BRXEN
BDATA
RESET
VDD
R701 220
R702 220
C704 100P
R801 0
C703 100P
ROUT (DOUT)
AGND (BCK)
LOUT (LRCK)
GND1
GND2
GND3
GND4
PGND1
PGND2
GND
PGND
VD
VDD
GND
BSRQ
BRXEN
BSCK
BDATA
RESET
TESTIN
FLMD0
VDSENS
TEMP
HOME
ROM
RAM2
RAM1
RAM0
FULL
EMP
FLRQ
FWDDE
R244 47K
R239 47K
R286 100K
R235 10K
R204 220
R81
C204
R235 47K
C202
R205 47K (1608)
2
3

C-a C-b

C-b


RF AMP, CD DE
DIGITAL SERV
EEPROM
PICKUP UNIT(P10.5)(SERVICE)
E: P5+P10
F: P1+P6
HOLOGRAM UNIT
CN101
SWITCHES:
CD CORE UNIT(S10.5COMP2)
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
F. ACT: Applying positive voltage to FOP.
The lens moves DISC side.
T. ACT: Applying positive voltage to TOP.
The lens moves outer circumference.

C-a C-b


EEPROM
CD DRIVER
MOTOR DRIVER LOGIC TABLE
LOAD CLCONT LOEJ CONT
EJ H H L H
PLAY OFF L L H L
SWITCHES:
CD CORE UNIT(S10.5COMP2)
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
S905:8EJ SWITCH.....ON-OFF
The underlined indicates the switch position.
M1 CXC7134
SPINDLE MOTOR
M2 CXC4026
LOADING/CARRIAGE MOTOR

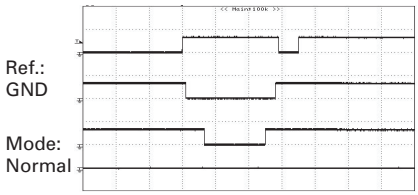
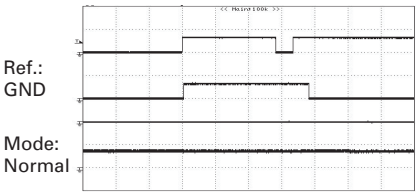
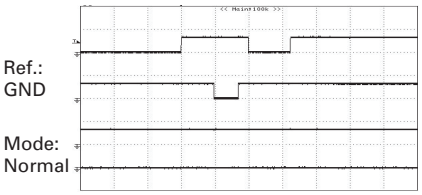
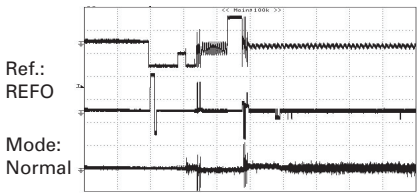
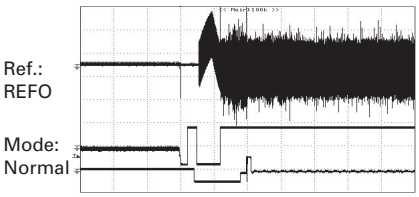
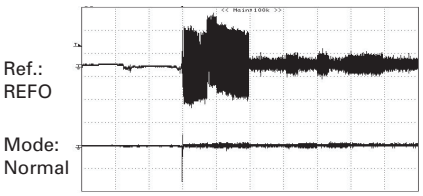
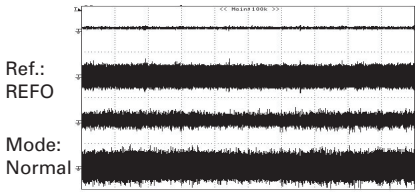
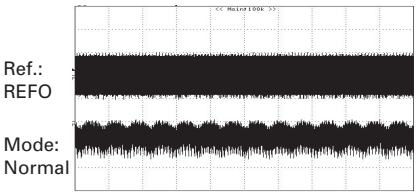
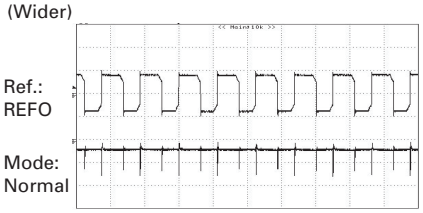
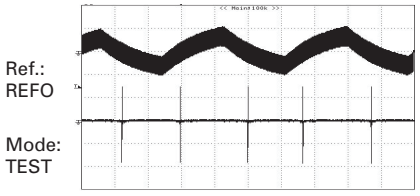
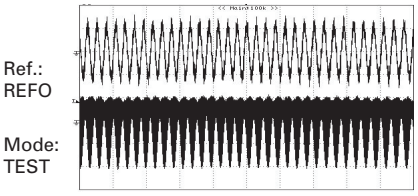
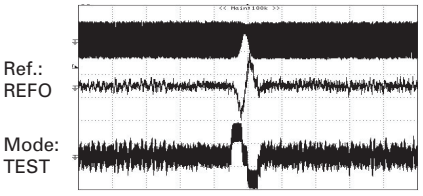
C-b

C-a c-b

C-a

● Waveforms

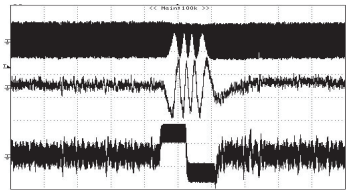
Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65 V)

①DSCSNS 5 V/div 500 ms/div ②8SNS 5 V/div ③12SNS 5 V/div ④LOEJ 5 V/div 12 cm CD Loading operation  	①DSCSNS 5 V/div 500 ms/div ⑤CLCONT 5 V/div ④LOEJ 5 V/div ⑥VD 10 V/div 12 cm CD Loading operation  	①DSCSNS 5 V/div 500 ms/div ②8SNS 5 V/div ③12SNS 5 V/div ④LOEJ 5 V/div 8 cm CD Loading operation 
⑦SIN 1 V/div 1 s/div ⑧CIN 500 mV/div ⑨TIN 1 V/div 12 cm CD-DA setup operation after loading  	⑩FIN 200 mV/div 500 ms/div ⑪RFOK(MONI_2) 2 V/div ⑦SIN 2 V/div 12 cm CD-DA Source On setup operation  	⑫TE 500 mV/div 200 ms/div ⑬FE 500 mV/div Source On setup operation 
⑬FE 500 mV/div 20 ms/div ⑩FIN 500 mV/div ⑫TE 500 mV/div ⑨TIN 500 mV/div CD-DA Play operation  	⑭MDX 2 V/div 200 ms/div ⑦SIN 500 mV/div Spindle waveform during play operation  	⑭MDX 2 V/div 5 µs/div ⑦SIN 500 mV/div Spindle waveform during play operation (Wider) 
⑩FIN 500 mV/div 200 ms/div ⑬FE 500 mV/div Focus Search waveform  	⑫TE 500 mV/div 2 ms/div ⑮RFAGC 500 mV/div Track Open waveform  	⑮RFAGC 1 V/div 500 µs/div ⑫TE 500 mV/div ⑨TIN 500 mV/div 1 Track Jump waveform 

⑮RFAGC	1 V/div	500 µs/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

4 Tracks Jump waveform

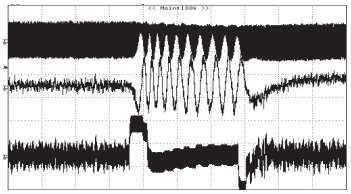
Ref.: REFO
Mode: TEST



⑮RFAGC	1 V/div	500 µs/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

10 Tracks Jump waveform

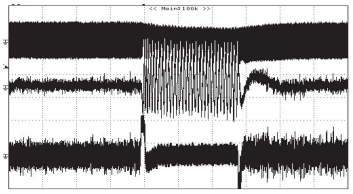
Ref.: REFO
Mode: TEST



⑮RFAGC	1 V/div	2 ms/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

32 Tracks Jump waveform

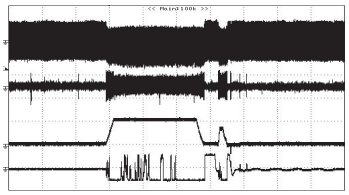
Ref.: REFO
Mode: TEST



⑮RFAGC	1 V/div	200 ms/div
⑫TE	1 V/div	
⑧CIN	1 V/div	
⑦SIN	2 V/div	

Search operation(Outter to Inner)

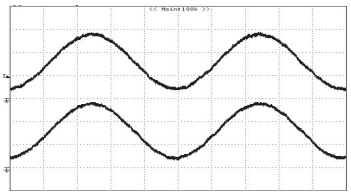
Ref.: REFO
Mode: Normal



⑯LOUT	1 V/div	200 µs/div
⑰ROUT	1 V/div	

Analog audio waveform

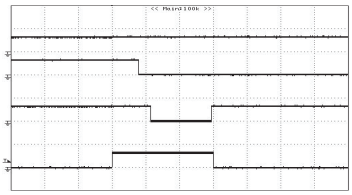
Ref.: AGND
Mode: Normal



①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

12 cm CD Eject operation

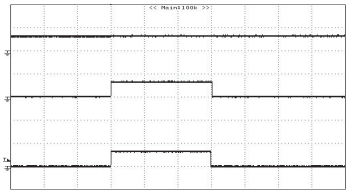
Ref.: GND
Mode: Normal



①DSCSNS	5 V/div	500 ms/div
⑤CLCONT	5 V/div	
④LOEJ	5 V/div	

12 cm CD Eject operation

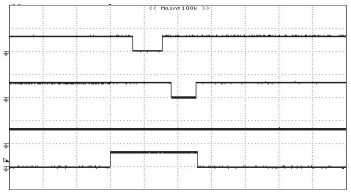
Ref.: GND
Mode: Normal



①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

8 cm CD Eject operation

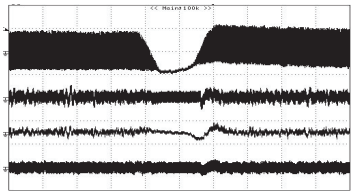
Ref.: GND
Mode: Normal



⑮RFAGC	1 V/div	500 µs/div
⑨TIN	1 V/div	
⑫TE	1 V/div	
⑩FIN	1 V/div	

Black dot(800 µm) during play

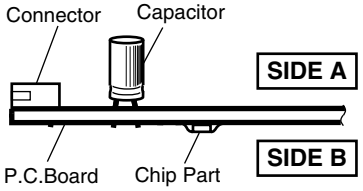
Ref.: REFO
Mode: Normal



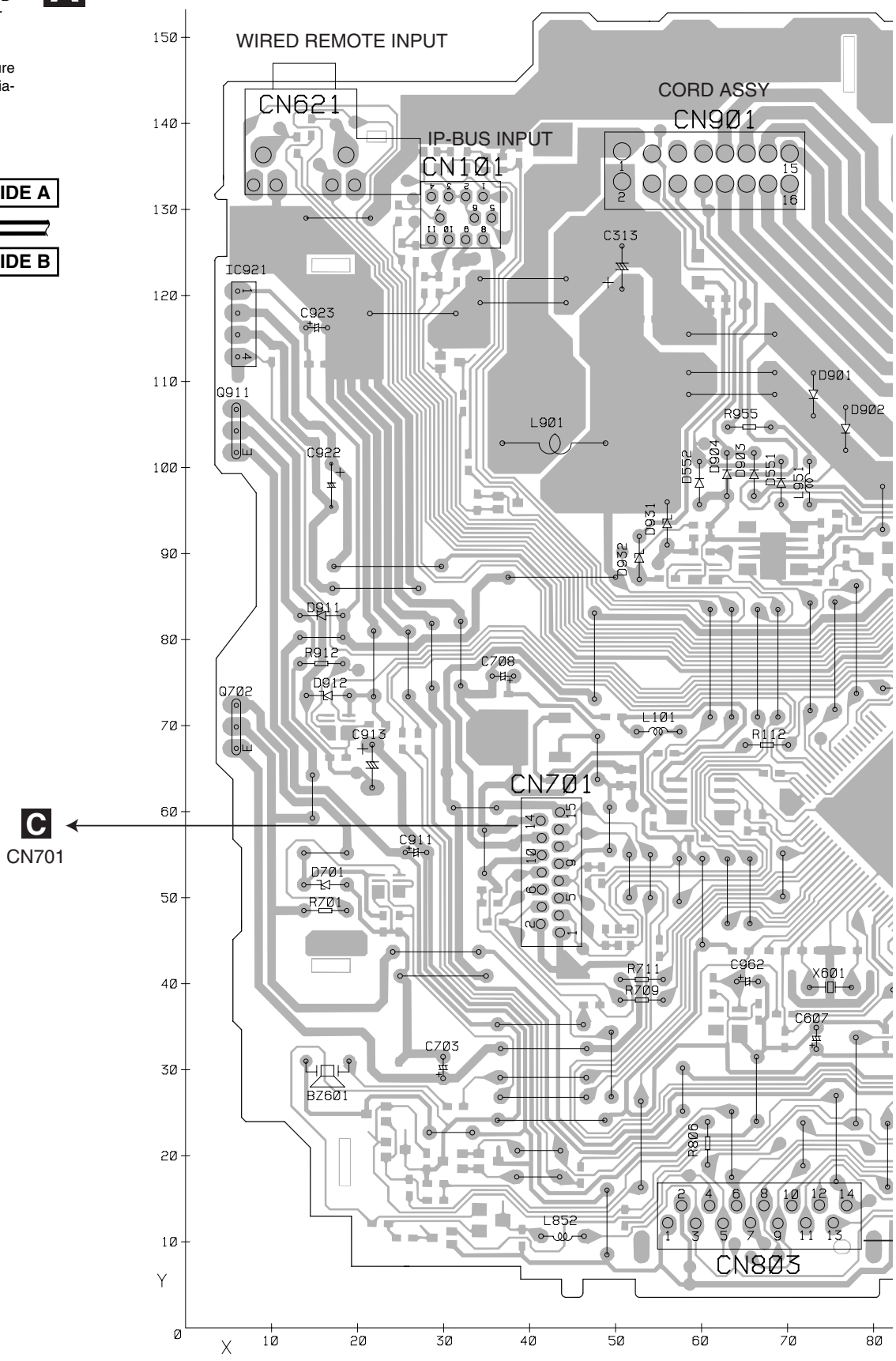
4. PCB CONNECTION DIAGRAM
4.1 TUNER AMP UNIT

NOTE FOR PCB DIAGRAMS

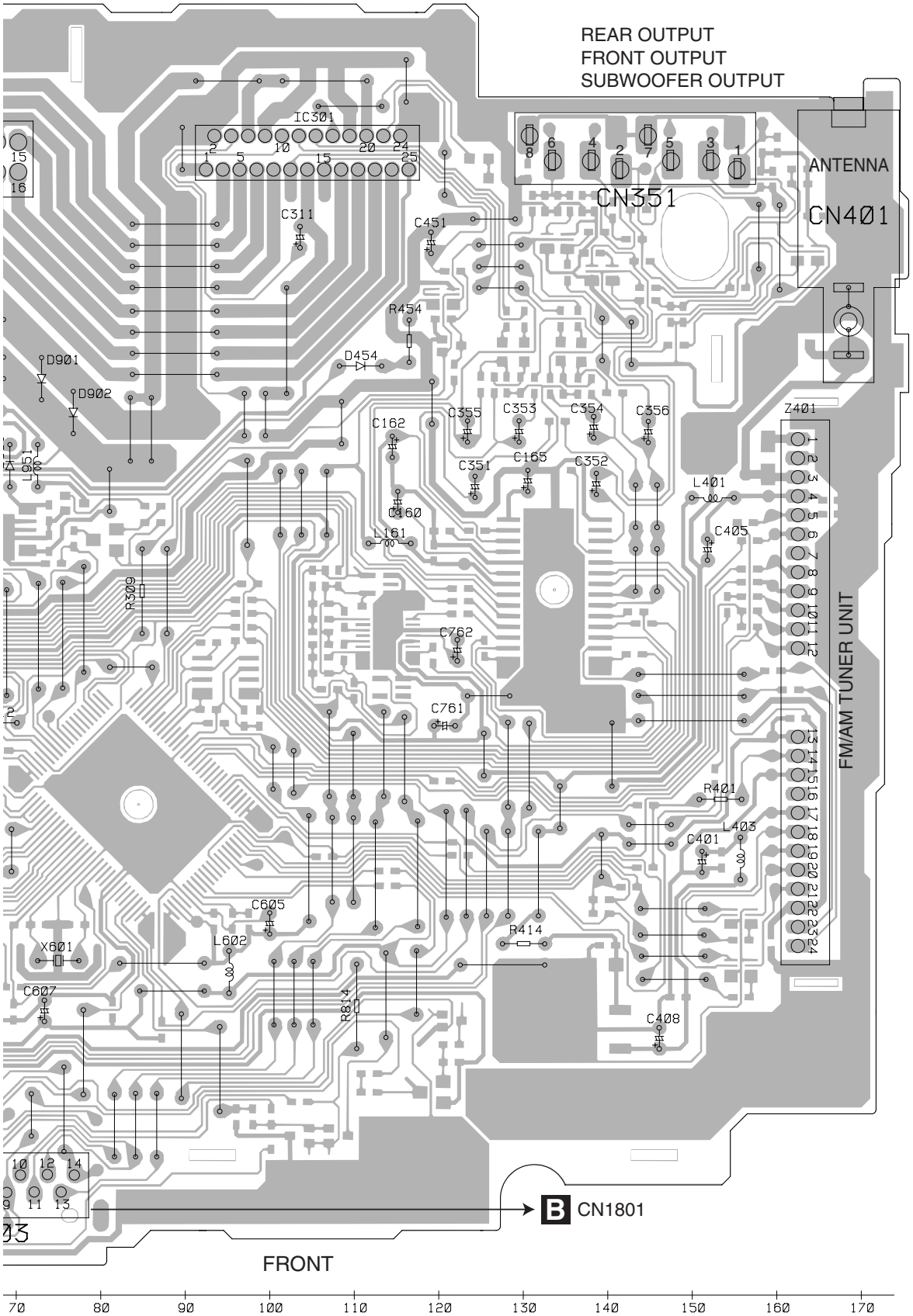
1. The parts mounted on this PCB include all necessary parts for several destination. For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



A TUNER AMP UNIT

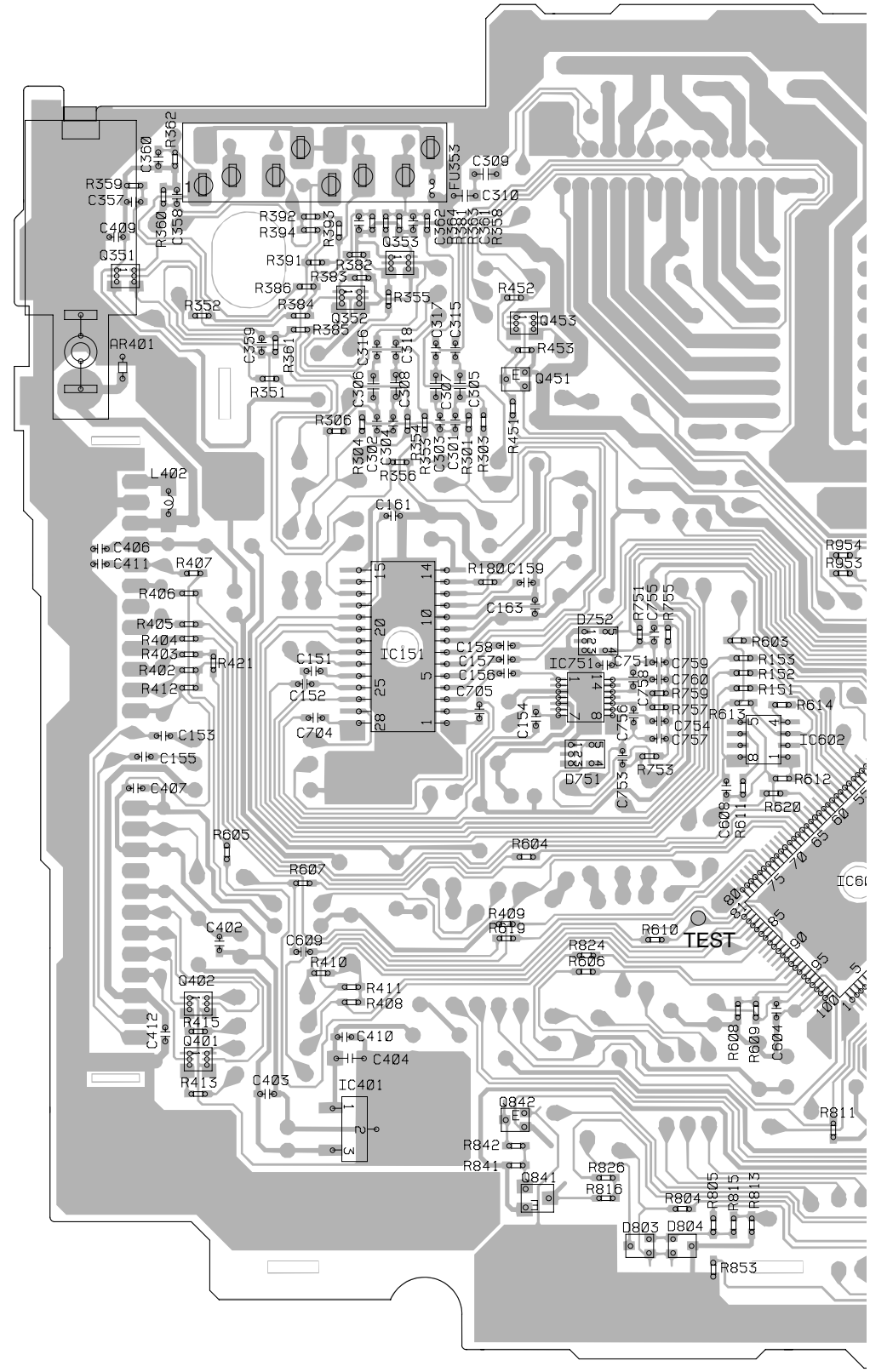


SIDE A


REAR OUTPUT
FRONT OUTPUT
SUBWOOFER OUTPUT
IC301
CN351
ANTENNA
CN401
C311
C451
R454
D454
D901
D902
C162
C355
C353
C354
C356
C351
C165
C352
C160
L161
L401
C405
Z401
FM/AM TUNER UNIT
R509
C762
C761
R401
L403
C401
C605
R414
X601
L602
C607
R814
C408
B CN1801
FRONT
70 80 90 100 110 120 130 140 150 160 170

A

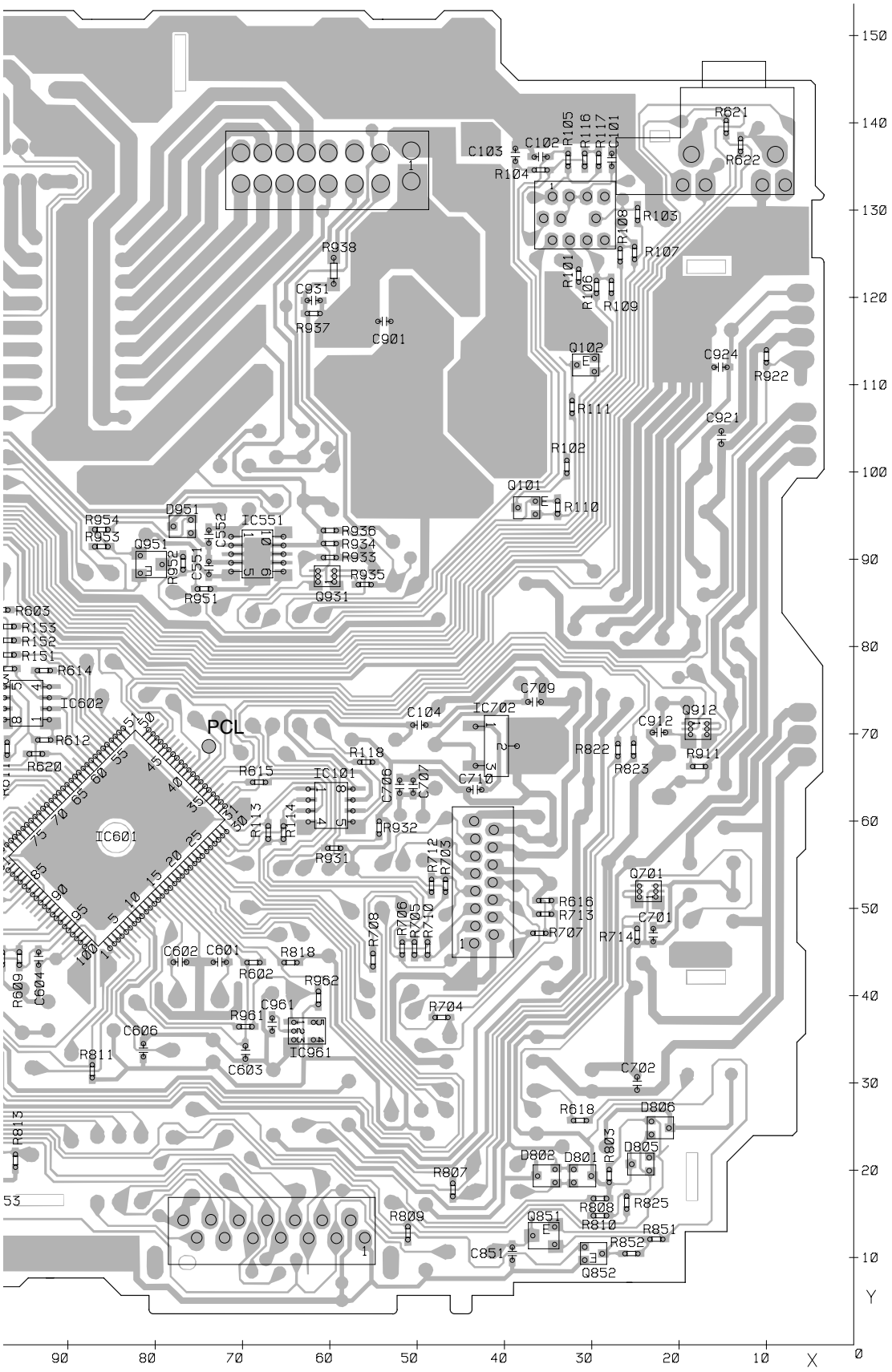
A TUNER AMP UNIT



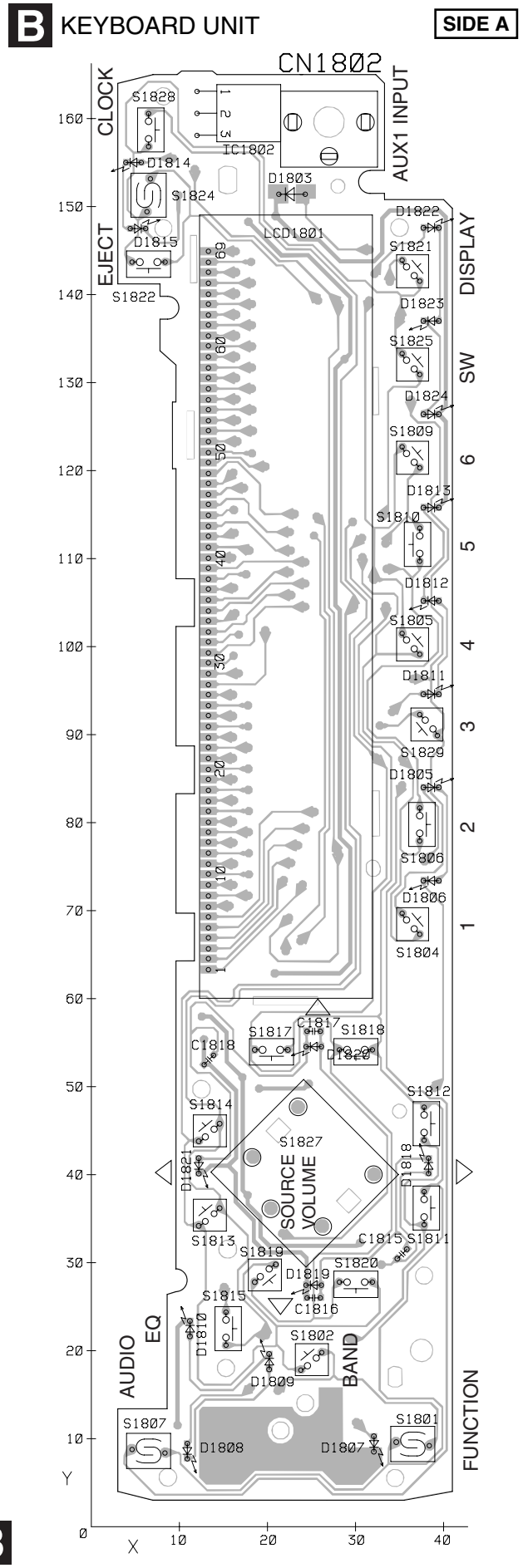
A

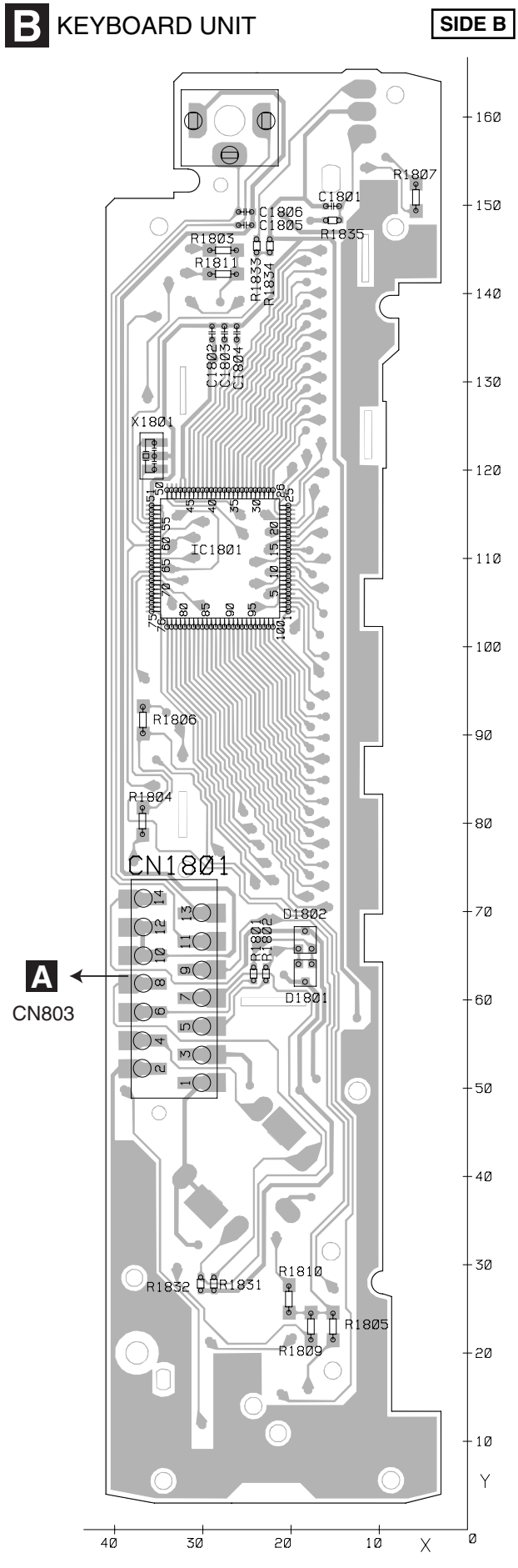
⚠FU 353 (B,131,133) Fuse 3 A CEK1286

SIDE B



4.2 KEYBOARD UNIT





A

B

C

D

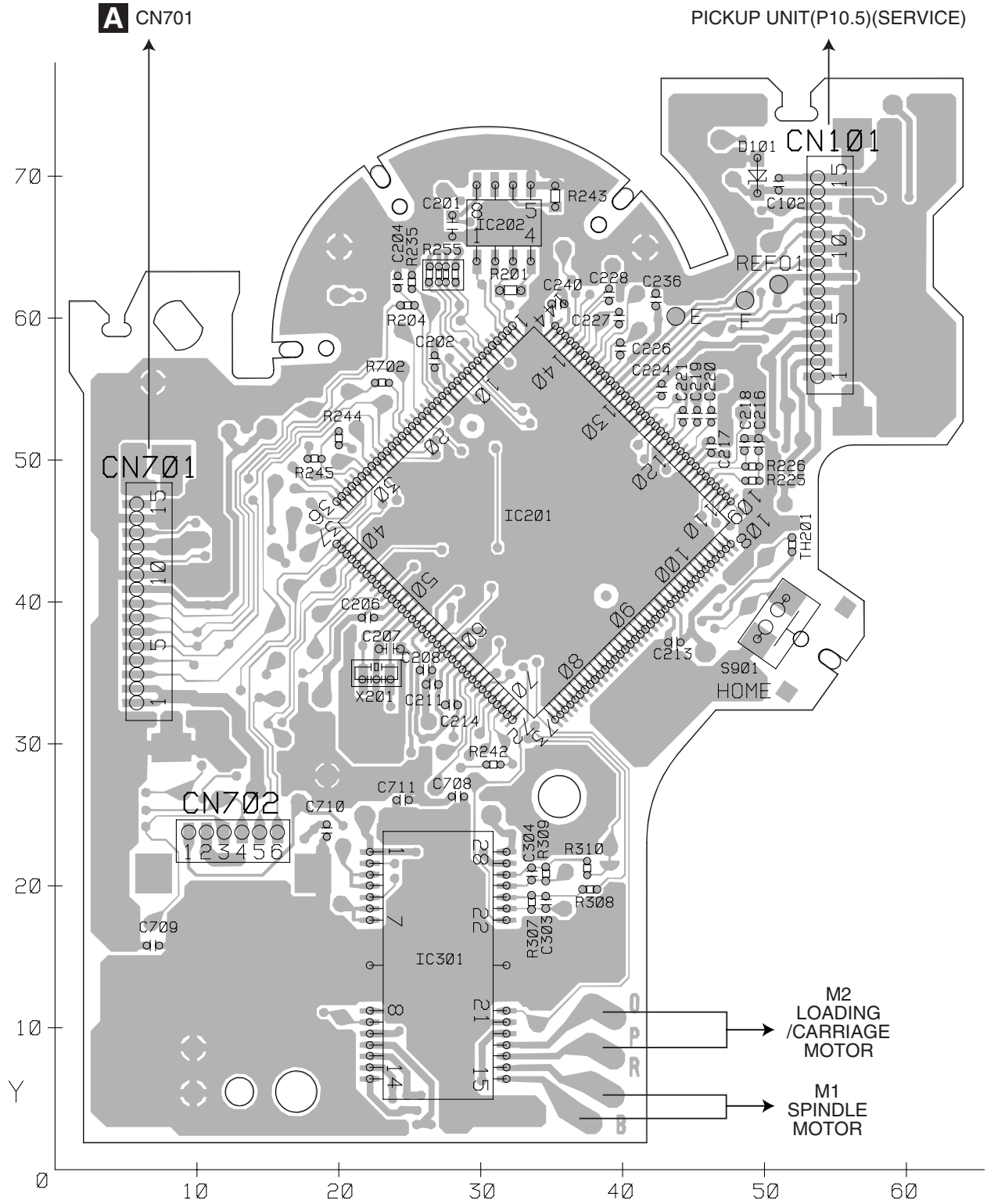
E

F

4.3 CD CORE UNIT(S10.5COMP2)

C CD CORE UNIT(S10.5COMP2)

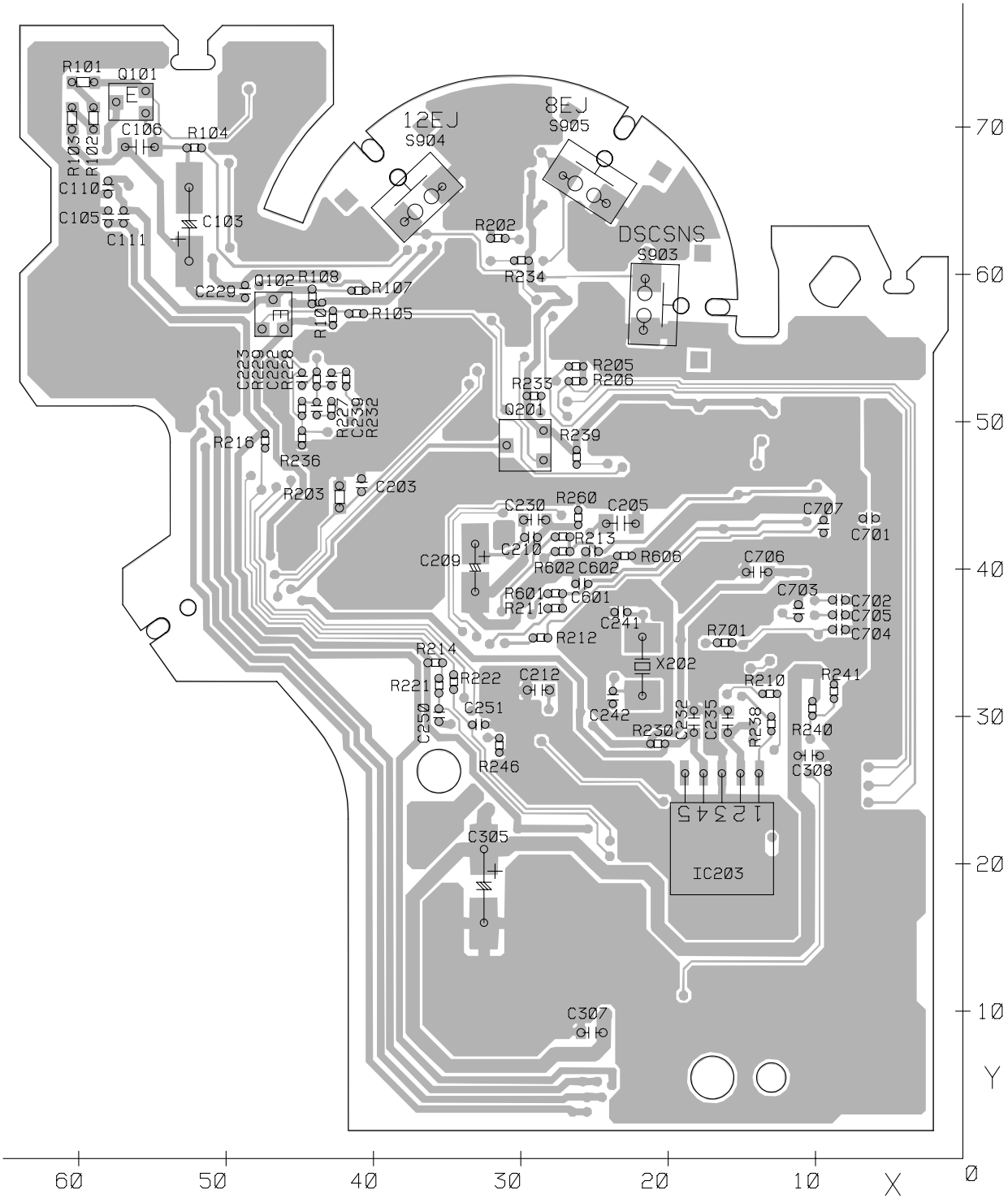
SIDE A



C

C CD CORE UNIT(S10.5COMP2)

SIDE B



5. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

  Chip Resistor

  RS1/◯S◯◯◯J,RS1/◯◯S◯◯◯J

  Chip Capacitor (except for CQS.....)

  CKS....., CCS....., CSZS.....
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Meaning of the figures and others in the parentheses in the parts list.*

  Example) IC 301 is on the point (face A, 91 of x-axis, and 111 of y-axis) of the corresponding PC board.

  IC 301 (A, 91, 111) IC NJM2068V

Circuit Symbol and No. **Part No.**

Unit Number : YWM5137(P390MP)
Unit Number : YWM5139(P3900MP)
Unit Name : Tuner Amp Unit
Unit Number :
Unit Name : Keyboard Unit
Unit Number : CWX3350
Unit Name : CD Core
Unit(S10.5COMP2)

A

Unit Number : YWM5137(P390MP)
Unit Number : YWM5139(P3900MP)
Unit Name : Tuner Amp Unit

MISCELLANEOUS

IC 101	(B,60,62) IC	HA12241FP
IC 151	(B,134,84) IC	PML015B
IC 301	(A,92,133) IC	PAL007C
IC 401	(B,137,31) IC	NJM2885DL1-33
IC 601	(B,84,58) IC	PEG286A
IC 702	(B,39,69) IC	NJM2885DL1-33
IC 751	(B,114,78) IC	NJM2794V
IC 921	(A,6,121) IC	NJM2388F84
IC 961	(B,63,36) IC	S-80835CNMC-B8U
Q 101	(B,37,96) Transistor	2SA1576A
Q 102	(B,31,112) Transistor	DTC114EUA
Q 351	(B,164,124) Transistor	UMH3N
Q 352	(B,139,121) Transistor	UMH3N
Q 353	(B,134,125) Transistor	UMH3N
Q 451	(B,122,112) Transistor	DTC124EUA
Q 453	(B,121,118) Transistor	UMD2N
Q 701	(B,24,52) Transistor	UMD2N
Q 702	(A,6,67) Transistor	2SD2396
Q 841	(B,119,24) Transistor	2SA1036K
Q 842	(B,122,32) Transistor	DTC114EUA
Q 851	(B,36,13) Transistor	2SA1036K
Q 852	(B,30,10) Transistor	DTC114EUA
Q 911	(A,6,102) Transistor	2SD2396
Q 912	(B,18,71) Transistor	UMD2N
Q 931	(B,60,88) Transistor	UMX1N
D 454	(A,108,110) Diode	1SS133
D 701	(A,19,52) Diode	HZS7L(C3)
D 751	(B,114,72) Diode	FTZ6R8E
D 752	(B,113,84) Diode	FTZ6R8E
D 801	(B,31,19) Diode	DAN202U
D 802	(B,35,19) Diode	DAP202U
D 803	(B,108,19) Diode	DAN202U
D 804	(B,104,19) Diode	DAP202U
D 805	(B,24,21) Diode	DAN202U
D 806	(B,22,25) Diode	DAP202U
D 901	(A,73,111) Diode	S5688G
D 902	(A,77,107) Diode	S5688G
D 903	(A,66,97) Diode	S5688G
D 904	(A,63,97) Diode	S5688G
D 911	(A,18,83) Diode	S5688G
D 912	(A,19,74) Diode	HZS6L(B2)
D 931	(A,56,91) Diode	HZS7L(C3)
D 932	(A,53,87) Diode	HZS7L(A1)
L 101	(A,52,69) Inductor	LAU2R2K
L 161	(A,112,89) Inductor	LAU2R2K
L 401	(A,155,94) Inductor	LAU1R0K
L 402	(B,159,99) Inductor	LCTAW220J2520
L 403	(A,156,54) Inductor	LAU1R0K
L 602	(A,95,41) Inductor	LAU2R2K
L 852	(A,46,11) Inductor	LAU2R2K
L 901	(A,36,103) Choke Coil 600 µH	CTH1280
X 601	(A,73,40) Resonator 15.000 MHz	YSS5002
⚠FU353	(B,131,133) Fuse 3 A	CEK1286
Z 401	(A,163,101) FM/AM Tuner Unit	CWE1952
AR401	(B,164,114) Surge Protector	IMSA-6801-01Y901
⚠	Fuse 10 A	CEK1208

RESISTORS

R 101	(B,32,123)	RS1/16S181J
R 102	(B,33,101)	RS1/16S222J

Circuit Symbol and No.		Part No.
R 103	(B,25,130)	RS1/16S181J
R 104	(B,36,135)	RS1/16S101J
R 105	(B,33,136)	RS1/16S101J
R 106	(B,29,121)	RS1/16S223J
R 107	(B,25,125)	RS1/16S223J
R 108	(B,27,125)	RS1/16S102J
R 109	(B,28,121)	RS1/16S102J
R 110	(B,34,96)	RS1/16S332J
R 111	(B,32,107)	RS1/16S562J
R 112	(A,65,68)	RD1/4PU102J
R 113	(B,67,59)	RS1/16S472J
R 114	(B,65,59)	RS1/16S472J
R 116	(B,31,136)	RS1/16S470J
R 117	(B,29,136)	RS1/16S150J
R 118	(B,56,67)	RS1/16S0R0J
R 151	(B,97,79)	RS1/16S102J
R 152	(B,97,81)	RS1/16S102J
R 153	(B,97,82)	RS1/16S102J
R 180	(B,125,91)	RS1/16S0R0J
R 301	(B,127,108)	RS1/16S471J
R 303	(B,125,108)	RS1/16S471J
R 304	(B,138,108)	RS1/16S471J
R 306	(B,141,107)	RS1/16S471J
R 309	(A,85,78)	RD1/4PU153J
R 351	(B,148,112)	RS1/16S821J
R 352	(B,155,119)	RS1/16S0R0J
R 353	(B,131,108)	RS1/16S821J
R 354	(B,133,108)	RS1/16S821J
R 355	(B,135,121)	RS1/16S821J
R 356	(B,134,103)	RS1/16S821J
R 358	(B,131,129)	RS1/16S821J
R 359	(B,163,133)	RS1/16S223J
R 360	(B,160,132)	RS1/16S223J
R 361	(B,147,116)	RS1/16S223J
R 362	(B,158,136)	RS1/16S223J
R 363	(B,134,129)	RS1/16S223J
R 364	(B,137,129)	RS1/16S223J
R 381	(B,136,129)	RS1/16S0R0J
R 382	(B,139,126)	RS1/16S0R0J
R 383	(B,138,123)	RS1/16S0R0J
R 384	(B,145,119)	RS1/16S0R0J
R 385	(B,145,118)	RS1/16S0R0J
R 386	(B,144,122)	RS1/16S0R0J
R 391	(B,143,125)	RS1/16S0R0J
R 392	(B,144,130)	RS1/16S0R0J
R 401	(A,156,59)	RD1/4PU681J
R 403	(B,157,83)	RS1/16S681J
R 404	(B,157,84)	RS1/16S681J
R 405	(B,157,86)	RS1/16S681J
R 406	(B,157,89)	RS1/16S681J
R 407	(B,156,91)	RS1/16S0R0J
R 414	(A,133,42)	RD1/4PU1R8J
R 421	(B,154,82)	RS1/16S0R0J
R 451	(B,122,109)	RS1/16S103J
R 452	(B,122,121)	RS1/16S221J
R 453	(B,121,116)	RS1/16S153J
R 454	(A,117,115)	RD1/4PU102J
R 602	(B,69,44)	RS1/16S103J
R 603	(B,98,84)	RS1/16S103J
R 604	(B,120,61)	RS1/16S681J

Circuit Symbol and No.		Part No.
R 605	(B,153,61)	RS1/16S681J
R 606	(B,114,48)	RS1/16S103J
R 607	(B,144,58)	RS1/16S681J
R 608	(B,98,44) (P3900MP)	RS1/16S473J
R 609	(B,96,44)	RS1/16S104J
R 610	(B,106,52)	RS1/16S473J
R 613	(B,97,77)	RS1/16S104J
R 615	(B,68,64)	RS1/16S0R0J
R 616	(B,35,51)	RS1/16S473J
R 620	(B,94,68)	RS1/16S0R0J
R 621	(B,15,140)	RS1/16S102J
R 622	(B,13,137)	RS1/16S102J
R 701	(A,14,49)	RD1/4PU271J
R 703	(B,47,53)	RS1/16S472J
R 704	(B,47,38)	RS1/16S104J
R 705	(B,50,45)	RS1/16S472J
R 706	(B,52,45)	RS1/16S104J
R 707	(B,36,47)	RS1/16S104J
R 708	(B,55,44)	RS1/16S221J
R 709	(A,56,38)	RD1/4PU102J
R 710	(B,49,45)	RS1/16S221J
R 711	(A,56,41)	RD1/4PU221J
R 712	(B,48,53)	RS1/16S221J
R 713	(B,35,49)	RS1/16S102J
R 714	(B,25,47)	RS1/16S104J
R 751	(B,108,85)	RS1/16S0R0J
R 753	(B,107,72)	RS1/16S0R0J
R 755	(B,105,85)	RS1/16S0R0J
R 757	(B,106,77)	RS1/16S223J
R 759	(B,106,79)	RS1/16S223J
R 803	(B,28,19)	RS1/16S473J
R 804	(B,104,23)	RS1/16S222J
R 805	(B,100,21)	RS1/16S222J
R 806	(A,61,19)	RD1/4PU222J
R 807	(B,46,18)	RS1/16S222J
R 808	(B,29,17)	RS1/16S104J
R 809	(B,51,13)	RS1/16S222J
R 810	(B,29,15)	RS1/16S103J
R 811	(B,87,31)	RS1/16S473J
R 813	(B,96,21)	RS1/16S104J
R 814	(A,110,29)	RD1/4PU102J
R 815	(B,98,21)	RS1/16S102J
R 816	(B,112,24)	RS1/16S1R0J
R 822	(B,27,68)	RS1/16S102J
R 823	(B,25,68)	RS1/16S102J
R 824	(B,114,50)	RS1/16S102J
R 825	(B,26,16)	RS1/16S102J
R 826	(B,112,26)	RS1/16S0R0J
R 841	(B,121,28)	RS1/16S103J
R 842	(B,121,30)	RS1/16S472J
R 851	(B,23,12)	RS1/16S153J
R 852	(B,25,10)	RS1/16S472J
R 853	(B,100,16)	RS1/16S222J
R 911	(B,18,66)	RS1/16S223J
R 912	(A,18,77)	RD1/4PU152J
R 922	(B,10,113)	RS1/16S473J
R 931	(B,60,57)	RS1/16S104J
R 932	(B,54,59)	RS1/16S104J
R 933	(B,60,90)	RS1/16S104J
R 934	(B,60,92)	RS1/16S473J

Circuit Symbol and No.		Part No.
R 935	(B,56,87)	RS1/16S473J
R 936	(B,60,93)	RS1/16S473J
R 937	(B,62,118)	RS1/16S473J
R 938	(B,60,123)	RS1/4SA102J
R 961	(B,70,36)	RS1/16S102J
R 962	(B,61,40)	RS1/16S822J

CAPACITORS

C 101	(B,28,136)	CKSRYB104K25
C 104	(B,50,71)	CKSRYB103K50
C 151	(B,143,81)	CKSRYB105K10
C 152	(B,144,80)	CKSRYB105K10
C 153	(B,160,74)	CKSRYB224K10
C 154	(B,119,76)	CKSRYB105K10
C 155	(B,162,72)	CKSRYB224K10
C 156	(B,123,81)	CKSRYB105K10
C 157	(B,123,82)	CKSRYB105K10
C 158	(B,123,84)	CKSRYB105K10
C 159	(B,120,90)	CKSRYB153K50
C 160	(A,115,93)	CEJQ100M16
C 161	(B,135,98)	CKSRYB153K50
C 162	(A,115,102)	CEJQ470M10
C 163	(B,119,88)	CKSRYB104K25
C 165	(A,131,95)	CEJQ100M16
C 305	(B,128,112)	CKSQYB474K16
C 306	(B,137,112)	CKSQYB474K16
C 307	(B,130,112)	CKSQYB474K16
C 308	(B,134,112)	CKSQYB474K16
C 309	(B,125,135)	CKSQYB225K10
C 310	(B,127,132)	CKSQYB225K10
C 311	(A,104,124)	CEJQ100M16
C 313	(A,51,121) 3 300 µF/16 V	CCH1494
C 315	(B,128,116)	CKSRYB474K10
C 316	(B,136,116)	CKSRYB474K10
C 317	(B,130,116)	CKSRYB474K10
C 318	(B,134,116)	CKSRYB474K10
C 351	(A,124,94)	CEJQ2R2M50
C 352	(A,139,95)	CEJQ2R2M50
C 353	(A,130,101)	CEJQ2R2M50
C 354	(A,138,102)	CEJQ2R2M50
C 355	(A,123,101)	CEJQ2R2M50
C 356	(A,145,101)	CEJQ2R2M50
C 357	(B,163,132)	CKSRYB222K50
C 358	(B,158,132)	CKSRYB222K50
C 401	(A,151,53)	CEJQ470M6R3
C 402	(B,153,52)	CKSRYB103K50
C 403	(B,148,35)	CKSRYB103K50
C 405	(A,152,90)	CEJQ101M10
C 406	(B,166,94)	CKSRYB104K25
C 407	(B,163,68)	CKSRYB103K50
C 408	(A,146,29)	CEJQ220M10
C 410	(B,140,41)	CKSRYB474K10
C 411	(B,166,92)	CCSRCH470J50
C 412	(B,160,40)	CKSRYB105K10
C 451	(A,119,123)	CEJQ330M10
C 601	(B,73,44)	CCSRCH180J50
C 602	(B,77,44)	CCSRCH180J50
C 604	(B,93,44)	CKSRYB105K10
C 605	(A,100,43)	CEJQ100M16
C 606	(B,81,34)	CKSRYB104K25
C 607	(A,73,32)	CEJQ100M16
C 609	(B,144,51)	CCSRCH470J50
C 701	(B,23,47)	CKSRYB473K25
C 703	(A,30,29)	CEJQ101M10
C 704	(B,143,76)	CKSRYB105K10
C 705	(B,125,77)	CKSRYB105K10
C 708	(A,38,76)	CEJQ220M10
C 709	(B,37,74)	CKSRYB105K10
C 710	(B,43,64)	CKSRYB474K10
C 751	(B,112,82)	CKSRYB104K25
C 753	(B,110,72)	CKSRYB472K50
C 754	(B,106,76)	CKSRYB105K10
C 755	(B,107,85)	CKSRYB472K50
C 756	(B,109,76)	CKSRYB105K10
C 758	(B,109,80)	CKSRYB105K10
C 760	(B,106,80)	CKSRYB105K10
C 761	(A,119,67)	CEJQ220M10
C 762	(A,122,75)	CEJQ100M16
C 851	(B,39,10)	CKSRYB104K25
C 901	(B,54,117)	CKSRYB104K25
C 911	(A,26,55)	CEJQ470M10
C 912	(B,22,70)	CKSRYB103K50
C 913	(A,22,63)	CEAT102M16
C 921	(B,15,104)	CKSRYB103K50
C 922	(A,17,100)	CEJQ221M10
C 923	(A,14,116)	CEJQ101M16
C 924	(B,15,112)	CKSRYB103K50
C 961	(B,67,37)	CKSRYB473K25
C 962	(A,64,40)	CEJQ100M16

B

Unit Number :
Unit Name : Keyboard Unit

MISCELLANEOUS

IC 1801	(B,28,110) IC	PD6538A
IC 1802	(A,12,161) IC	GP1UX51RK
D 1801	(B,18,63) Diode	DAN202U
D 1802	(B,18,67) Diode	DAP202U
D 1803	(A,23,151) Diode	NESW505C-5273
D 1805	(A,39,84) LED	SML-310PT
D 1806	(A,39,73) LED	SML-310PT
D 1807	(A,32,9) LED	SML-310PT
D 1808	(A,11,9) LED	SML-310PT
D 1809	(A,20,19) LED	SML-310PT
D 1810	(A,11,23) LED	SML-310PT
D 1811	(A,39,95) LED	SML-310PT
D 1812	(A,39,105) LED	SML-310PT
D 1813	(A,39,116) LED	SML-310PT
D 1814	(A,5,155) LED	SML-310PT
D 1815	(A,5,148) LED	SML-310PT
D 1818	(A,38,41) LED	CL-197HB1-D(CDE)
D 1819	(A,25,27) LED	CL-197HB1-D(CDE)
D 1820	(A,25,55) LED	CL-197HB1-D(CDE)
D 1821	(A,12,41) LED	CL-197HB1-D(CDE)
D 1822	(A,39,148) LED	SML-310PT
D 1823	(A,39,137) LED	SML-310PT

Circuit Symbol and No.			Part No.
D 1824	(A,39,126)	LED	SML-310PT
X 1801	(B,36,122)	Ceramic Resonator 5.00 MHz	CSS1547
S 1827	(A,25,41)	Switch(SOURCE VOLUME)	YSD5013
LCD1801	(A,13,63)	LCD	YAW5080

RESISTORS

R 1801	(B,24,63)	RS1/16S222J
R 1802	(B,23,63)	RS1/16S222J
R 1803	(B,28,145)	RS1/4SA561J
R 1804	(B,37,80)	RS1/4SA471J
R 1805	(B,15,23)	RS1/4SA471J
R 1806	(B,37,92)	RS1/4SA471J
R 1807	(B,6,151)	RS1/4SA681J
R 1809	(B,18,23)	RS1/4SA681J
R 1810	(B,20,26)	RS1/4SA681J
R 1811	(B,28,142)	RS1/4SA471J
R 1831	(B,29,28)	RS1/16S472J
R 1833	(B,24,145)	RS1/16S2R2J
R 1835	(B,15,148)	RS1/16S121J

CAPACITORS

C 1801	(B,15,150)	CKSRYB474K10
C 1802	(B,29,136)	CKSRYF104Z25
C 1803	(B,28,136)	CKSRYF104Z25
C 1804	(B,26,136)	CKSRYF104Z25
C 1815	(A,35,31)	CKSRYF104Z25
C 1816	(A,25,26)	CKSRYF104Z25
C 1817	(A,25,56)	CKSRYF104Z25
C 1818	(A,13,53)	CKSRYF104Z25

C

Unit Number : CWX3350
Unit Name : CD Core
Unit(S10.5COMP2)

MISCELLANEOUS

IC 201	(A,34,46)	IC	PE5547A
IC 202	(A,32,67)	IC	S-93C56BD0I-J8
IC 301	(A,27,14)	IC	BA5839FP
Q 101	(B,56,72)	Transistor	2SA1577
Q 102	(B,47,57)	Transistor	2SB1689
X 201	(A,23,35)	Ceramic Resonator 16.934 MHz	CSS1603
S 901	(A,53,37)	Switch(HOME)	CSN1067
S 903	(B,19,58)	Switch(DSCSNS)	CSN1067
S 904	(B,38,67)	Switch(12EJ)	CSN1068
S 905	(B,24,68)	Switch(8EJ)	CSN1068

RESISTORS

R 101	(B,60,73)	RS1/10SR2R4J
R 102	(B,59,71)	RS1/10SR2R4J
R 103	(B,60,71)	RS1/10SR2R7J
R 104	(B,52,69)	RS1/16SS222J
R 105	(B,41,57)	RS1/16SS102J
R 107	(B,41,59)	RS1/16SS105J
R 201	(A,32,62)	RS1/16S472J
R 202	(B,32,62)	RS1/16SS473J
R 203	(B,42,45)	RS1/16S473J
R 204	(A,25,61)	RS1/16SS221J
R 206	(B,26,53)	RS1/16SS104J
R 210	(B,13,32)	RS1/16SS102J
R 214	(B,36,34)	RS1/16SS472J
R 216	(B,47,49)	RS1/16SS472J
R 221	(B,36,32)	RS1/16SS103J
R 222	(B,35,32)	RS1/16SS103J
R 225	(A,49,49)	RS1/16SS103J
R 226	(A,49,50)	RS1/16SS393J
R 227	(B,45,51)	RS1/16SS562J
R 228	(B,42,53)	RS1/16SS122J
R 229	(B,44,53)	RS1/16SS472J
R 230	(B,21,28)	RS1/16SS0R0J
R 232	(B,43,51)	RS1/16SS122J
R 233	(B,29,52)	RS1/16SS103J
R 234	(B,30,61)	RS1/16SS473J
R 235	(A,25,63)	RS1/16SS473J
R 239	(B,26,48)	RS1/16SS473J
R 240	(B,10,31)	RS1/16SS473J
R 241	(B,9,32)	RS1/16SS103J
R 243	(A,35,69)	RS1/16S0R0J
R 244	(A,20,52)	RS1/16SS473J
R 255	(A,27,63)	RAB4CQ104J
R 307	(A,34,19)	RS1/16SS183J
R 308	(A,38,20)	RS1/16SS183J
R 309	(A,35,21)	RS1/16SS183J
R 310	(A,38,21)	RS1/16SS183J
R 601	(B,28,38)	RS1/16SS0R0J
R 602	(B,27,41)	RS1/16SS0R0J
R 606	(B,23,41)	RS1/16SS0R0J
R 701	(B,16,35)	RS1/16SS221J
R 702	(A,23,55)	RS1/16SS221J

CAPACITORS

C 106	(B,56,69)	CKSQYB475K6R3
C 201	(A,28,67)	CKSRYB104K16
C 202	(A,27,57)	CKSSYB104K10
C 204	(A,24,63)	CKSSYB103K16
C 205	(B,23,43)	CKSQYB475K6R3
C 206	(A,22,39)	CKSSYB104K10
C 207	(A,24,37)	CKSRYB104K16
C 209	(B,33,40)	CEVW220M6R3
C 210	(B,29,42)	CKSSYB104K10
C 211	(A,27,34)	CKSSYB104K10
C 212	(B,29,32)	CKSRYB104K16
C 213	(A,44,37)	CKSSYB104K10
C 214	(A,28,33)	CKSSYB104K10
C 216	(A,50,51)	CKSSYB332K50
C 217	(A,46,51)	CKSSYB104K10
C 218	(A,49,51)	CKSSYB473K10
C 219	(A,45,53)	CKSSYB104K10
C 220	(A,46,53)	CKSSYB182K50
C 221	(A,44,53)	CKSSYB104K10
C 222	(B,43,53)	CCSSCH560J50
C 223	(B,45,53)	CCSSCH4R0C50
C 224	(A,43,55)	CKSSYB104K10
C 226	(A,40,58)	CCSSCH680J50
C 227	(A,40,60)	CCSSCH470J50
C 228	(A,39,62)	CKSSYB103K16

Circuit Symbol and No.		Part No.
C 229	(B,49,59)	CKSSYB104K10
C 236	(A,42,61)	CKSSYB104K10
C 239	(B,44,51)	CCSSCH220J50
C 240	(A,35,61)	CKSSYB104K10
C 250	(B,36,30)	CKSSYB102K50
C 251	(B,33,29)	CKSSYB102K50
C 303	(A,35,19)	CKSSYB472K25
C 304	(A,34,21)	CKSSYB223K16
C 307	(B,25,9)	CKSRYB104K16
C 308	(B,10,27)	CKSRYB105K10
C 703	(B,11,37)	CCSSCH101J50
C 704	(B,8,36)	CKSSYB102K50
C 711	(A,25,26)	CKSSYB104K10

Miscellaneous Parts List

	Pickup Unit(P10.5)(Service)	CXX1942
M 1	Motor Unit(SPINDLE)	CXC7134
M 2	Motor Unit(LOADING/CARRIAGE)	CXC4026

6. ADJUSTMENT

6.1 CD ADJUSTMENT

1) Cautions on adjustments

• In this product the single voltage (3.3 V) is used for the regulator. The reference voltage is the REFO1 (1.65 V) instead of the GND.
If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:
a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments. Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.
b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.
c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

• Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

• For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

• In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

• The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

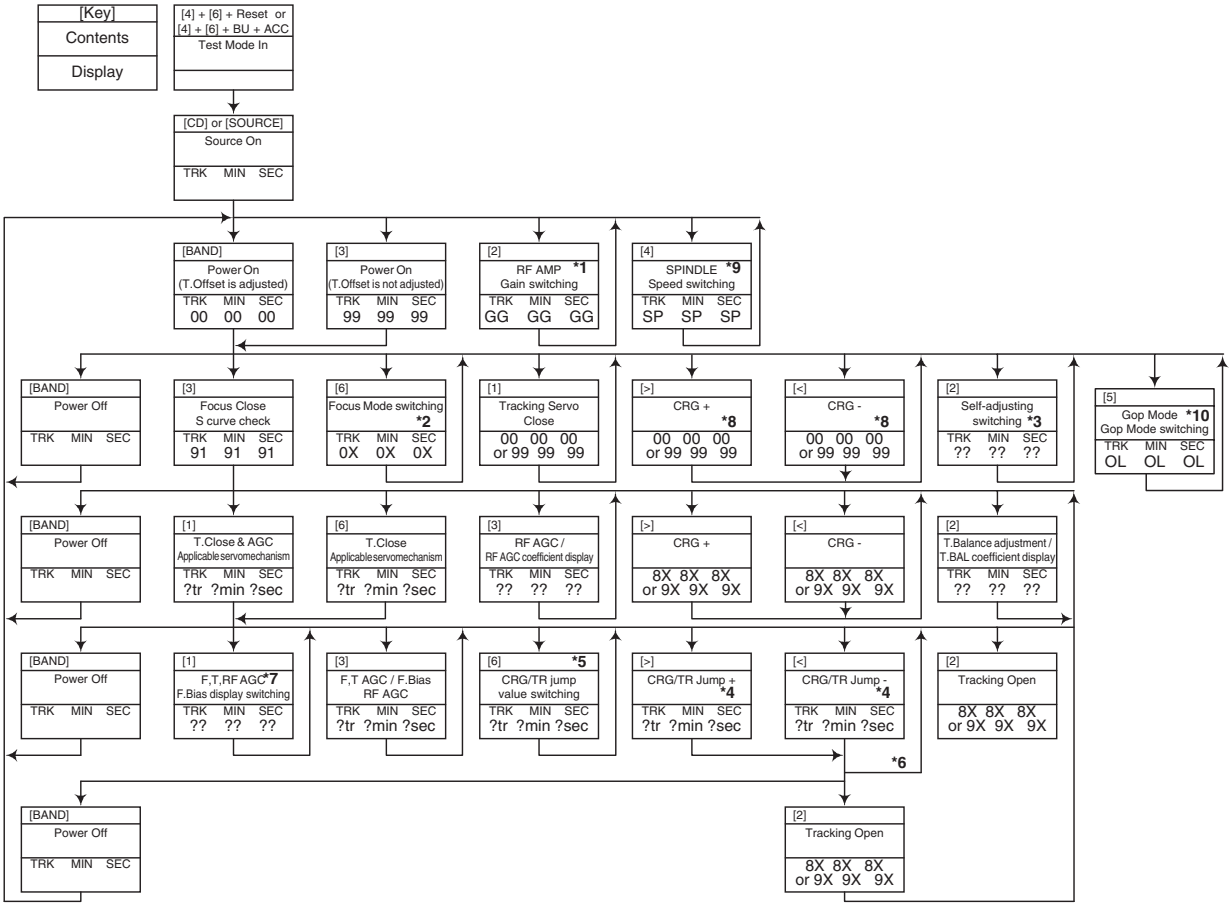
• The load and eject operation is not guarantied with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode

This mode is used to adjust the CD mechanism module.
• To enter the test mode.
While pressing the 4 and 6 keys at the same time, reset.
• To exit from the test mode.
Turn off the ACC and back up.

Notes:
a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.
b. If you have pressed the (→) key or (←) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.
c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.
d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.
e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0 dB, and the auto-adjustment values are reset to the default settings.

● Flow Chart


[Key]
Contents
Display
[4] + [6] + Reset or [4] + [6] + BU + ACC
Test Mode In
[CD] or [SOURCE]
Source On
TRK MIN SEC
[BAND] Power On (T.Offset is adjusted) 00 00 00
[3] Power On (T.Offset is not adjusted) 99 99 99
[2] RF AMP *1 Gain switching GG GG GG
[4] SPINDLE *9 Speed switching SP SP SP
[BAND] Power Off
[3] Focus Close S curve check 91 91 91
[6] Focus Mode switching *2 0X 0X 0X
[1] Tracking Servo Close 00 00 00 or 99 99 99
[>] CRG + *8 00 00 00 or 99 99 99
[<] CRG - *8 00 00 00 or 99 99 99
[2] Self-adjusting switching *3 ?? ?? ??
[5] Gop Mode *10 Gop Mode switching OL OL OL
[1] T.Close & AGC Applicable servomechanism ?tr ?min ?sec
[6] T.Close Applicable servomechanism ?tr ?min ?sec
[3] RF AGC / RF AGC coefficient display ?? ?? ??
[>] CRG + 8X 8X 8X or 9X 9X 9X
[<] CRG - 8X 8X 8X or 9X 9X 9X
[2] T.Balance adjustment / T.BAL coefficient display ?? ?? ??
[1] F,T,RF AGC *7 F.Bias display switching ?? ?? ??
[3] F,T AGC / F.Bias RF AGC ?tr ?min ?sec
[6] *5 CRG/TR jump value switching ?tr ?min ?sec
[>] CRG/TR Jump + *4 ?tr ?min ?sec
[<] CRG/TR Jump - *4 ?tr ?min ?sec
[2] Tracking Open 8X 8X 8X or 9X 9X 9X
*6

*1) TYP (TRK MIN SEC) → + 6 dB ($^{TRK}06^{MIN}06^{SEC}06$) → + 12 dB ($^{TRK}12^{MIN}12^{SEC}12$)

*2) Focus Close → S Curve check setting → F EQ measurement setting
$^{TRK}00^{MIN}00^{SEC}00$ ($^{TRK}99^{MIN}99^{SEC}99$) $^{TRK}01^{MIN}01^{SEC}01$ $^{TRK}02^{MIN}02^{SEC}02$

*3) F.Offset Display → RF.Offset → T.Offset Display → Switch to the order of the original display

*4) 1TR/4TR/10TR/32TR/100TR

*5) Single → 4TR → 10TR → 32TR → 100TR → CRG Move
9x(8x):91(81) 92(82) 93(83) 94(84) 95(85) 96(86)

*6) Only at the time of CRG move, 100TR jump

*7) TRK/MIN/SEC → F.AGC → T.AGC Gain → F.Bias → RF AGC

*8) CRG motor voltage = 2 [V]

*9) TYP (1X) (TRK MIN SEC) → 2X ($^{TRK}22^{MIN}22^{SEC}22$) → 1X ($^{TRK}11^{MIN}11^{SEC}11$)

*10) OFF(TYP) (TRK MIN SEC) → FORCUS ($^{TRK}70^{MIN}70^{SEC}70$) → TRACKING ($^{TRK}71^{MIN}71^{SEC}71$)

[Key]	Operation Test Mode
[BAND]	Power On/Off
[>]	CRG + / TR Jump + (Direction of the external surface)
[<]	CRG - / TR Jump - (Direction of the internal surface)
[1]	T. CLS & AGC & Applicable servomechanism / AGC,AGC display setting
[2]	RF Gain switching / Offset adjustment display / T.Balance adjustment / T. Open
[3]	F. Close,S Curve / Rough Servo and RF AGC / F,T,RF AGC
[4]	SPDL 1X/2X switching As for the double speed(2x), audio output cannot be supported.
[5]	Error Rate measurement ON : ERR 30Counts Start BER display data[%]
[6]	F. Mode switching / Tracking Close / CRG•TR Jump Switching

• As for the double speed (2x), audio output cannot be supported

*) • After the [Eject] key is pressed keys other than the [Eject] key should not be pressed, until disc ejection is complete.
• When the key [2] or [3] is pressed during the Focus Search, the power supply should be immediately turned off (otherwise the lens sticks to Wall, causing the actuator to be damaged).
• In the case of TR jump other than to 100TR, the function shall continue to be processed even if the TR jump key is released. As for the CRG Move and 100TR Jump, the mechanism shall be set to the Tracking Close mode when the key is released.
• When the power is turned on/off the jump mode is reset to the Single TR (91) while the gain of the RFAMP is reset to 0 dB. At the same time all the self-adjusting values shall return to the default setting.

6.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

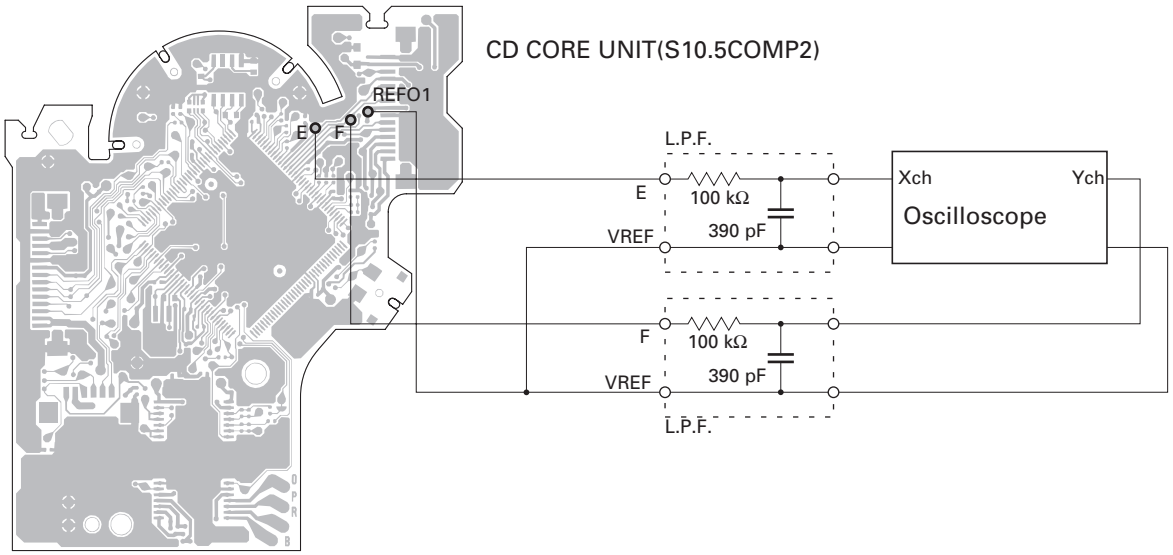
• **Note :**
The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

• **Purpose :**
To check that the grating is within an acceptable range when the PU unit is changed.

• **Symptoms of Mal-adjustment :**
If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

• **Method :**

• Measuring Equipment	• Oscilloscope, Two L.P.F.
• Measuring Points	• E, F, REFO1
• Disc	• TCD-782
• Mode	• TEST MODE



• **Checking Procedure**
1. In test mode, load the disc and switch the 3 V regulator on.
2. Using the → and ← buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75° . Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

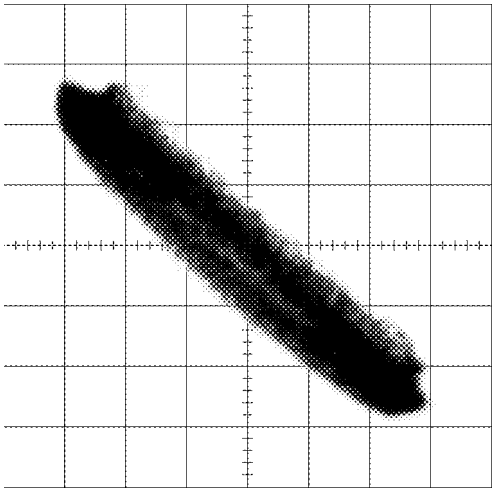
• **Note**
Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

• **Hint**
Reloading the disc changes the clamp position and may decrease the "wobble".

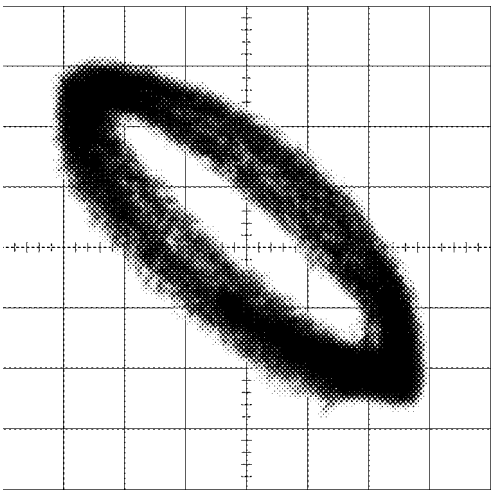
Grating waveform

Ech → Xch 20 mV/div, AC
Fch → Ych 20 mV/div, AC

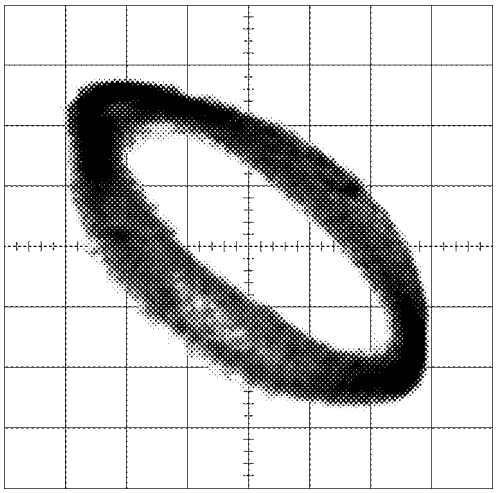
0°



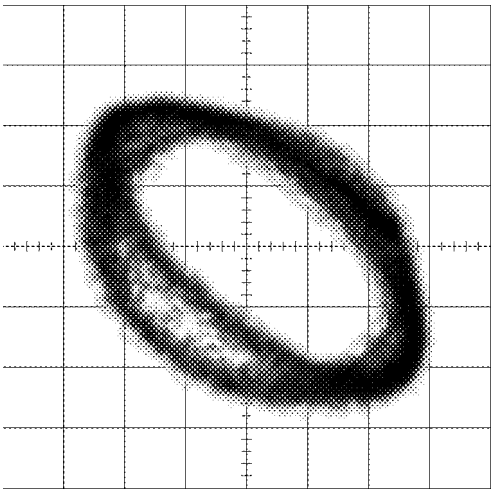
30°



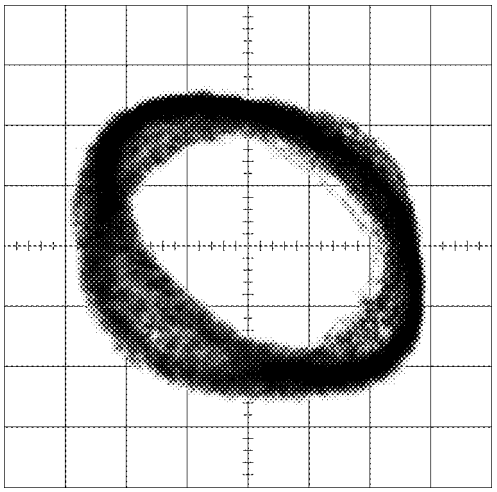
45°



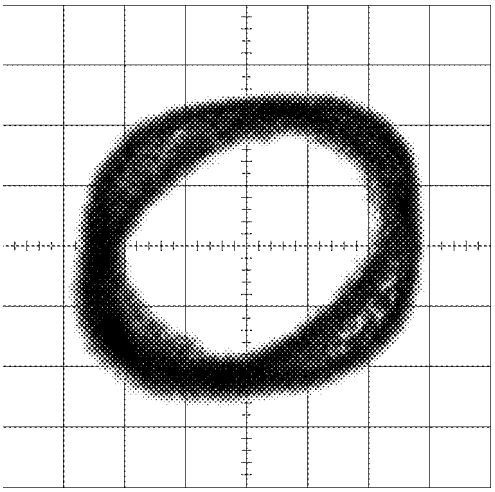
60°



75°



90°



6.3 ERROR MODE

● Error Messages

If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

2) Head unit display examples

Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.

8-digit display	6-digit display	4-digit display
ERROR–xx	ERR–xx	E–xx

(2) Error Code List

Code	Class	Displayed error code	Description of the code and potential cause(s)
10	Electricity	Carriage Home NG SERVO LSI Communication Error	CRG can't be moved to inner diameter. CRG can't be moved from inner diameter. → Failure on home switch or CRG move mechanism. Communication error between microcomputer and SERVO LSI.
11	Electricity	Focus Servo NG	Focusing not available. → Stains on rear side of disc or excessive vibrations on REWRITABLE.
12	Electricity	Spindle Lock NG Subcode NG	Spindle not locked. Sub-code is strange (not readable). → Failure on spindle, stains or damages on disc, or excessive vibrations. A disc not containing CD-R data is found. Turned over disc are found, though rarely. CD signal error.
17	Electricity	Setup NG	AGC protection doesn't work. Focus can be easily lost. → Damages or stains on disc, or excessive vibrations on REWRITABLE.
30	Electricity	Search Time Out	Failed to reach target address. → CRG tracking error or damages on disc.
44	Electricity	ALL Skip	Skip setting for all track. (CD-R/RW)
50	Mechanism	CD On Mech Error	Mechanical error during CD ON. → Defective loading motor, mechanical lock and mechanical sensor.
A0	System	Power Supply NG	Power (VD) is ground faulted. → Failure on SW transistor or power supply (failure on connector).

Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).

Unreadable TOC does not constitute an error. An intended operation continues in this case.

Upper digits of an error code are subdivided as shown below:

1x: Setup relevant errors, 3x: Search relevant errors, Ax: Other errors.

6.4 SYSTEM MICROCOMPUTER TEST PROGRAM

● PCL Output

In the normal operation mode (with the detachable panel installed, the ACC switched ON, the standby mode cancelled), shift the TESTIN IC601(Pin 88) terminal to H.
The clock signal is output from the PCL terminal IC601(Pin 39).
The frequency of the clock signal is 468 750 Hz that is one 32th of the fundamental frequency.
The clock signal should be 468 750 Hz(- 10 Hz, + 15 Hz).
If the clock signal is out of the range, the X'tal (X601) should be replaced with new one.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

● **Removing the Case (not shown)**

1. Remove the Case.

● **Removing the CD Mechanism Module (Fig.1)**

1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.

● **Removing the Detachable Assy (Fig.1)**

2 Release the two latchs and then remove the Detachable Assy.

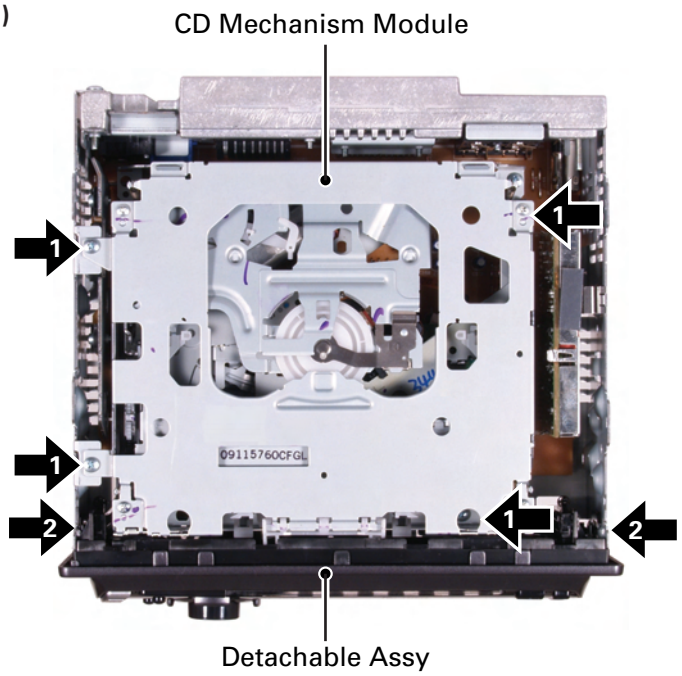


Fig.1

● **Removing the Tuner Amp Unit (Fig.2)**

1 Remove the screw.

2 Remove the three screws.

3 Straighten the tabs at four locations indicated and then remove the Tuner Amp Unit.

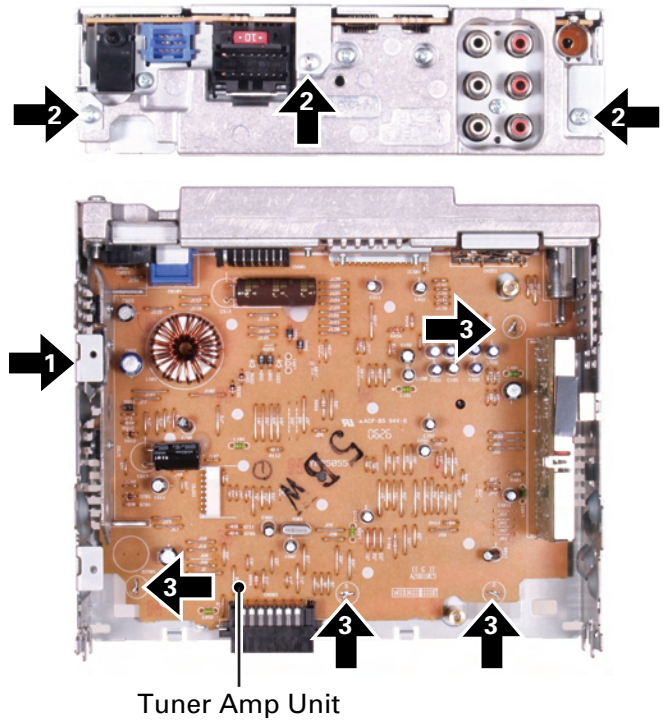
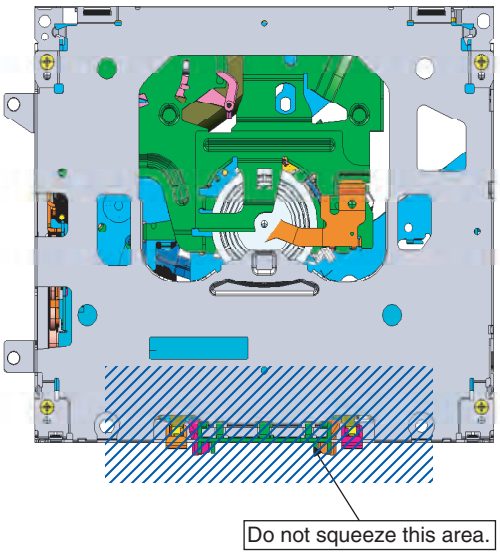


Fig.2

● How to hold the Mechanism Unit

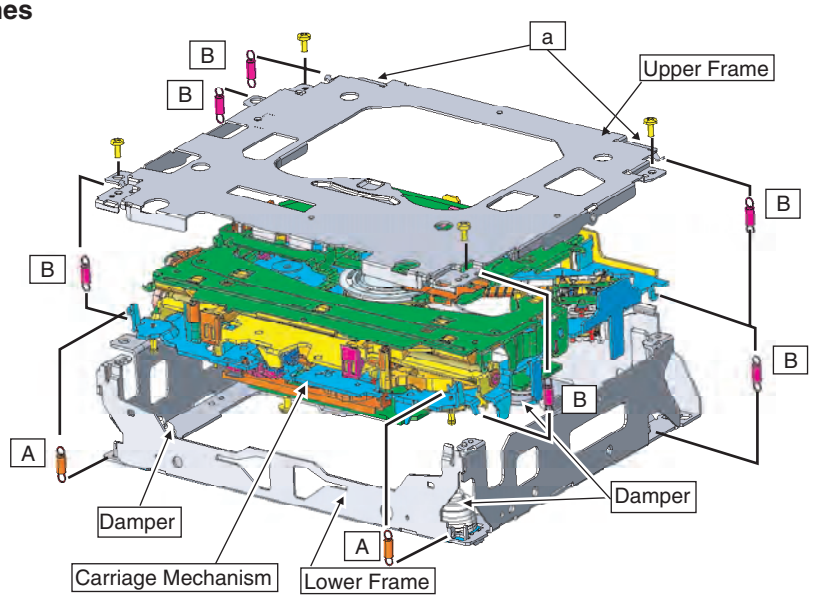
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

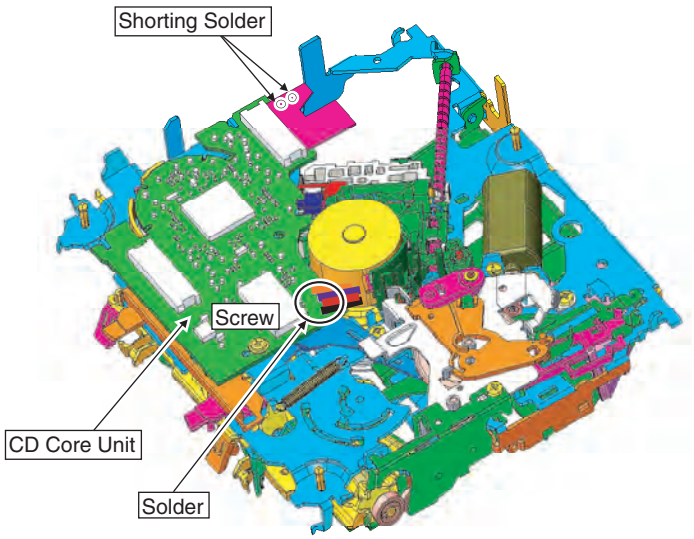
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.



● How to remove the CD Core Unit

1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

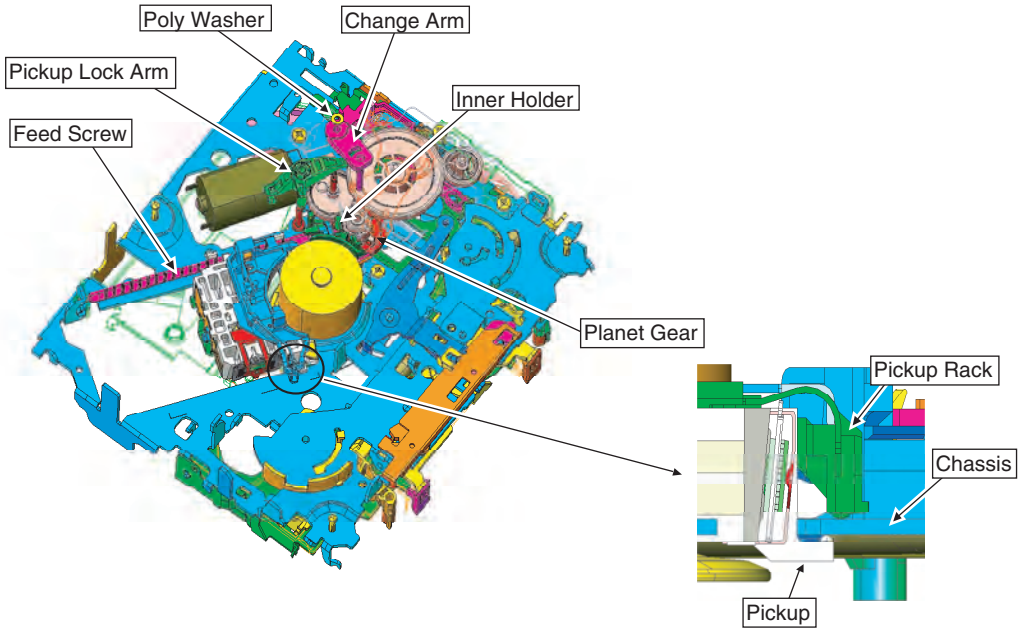
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



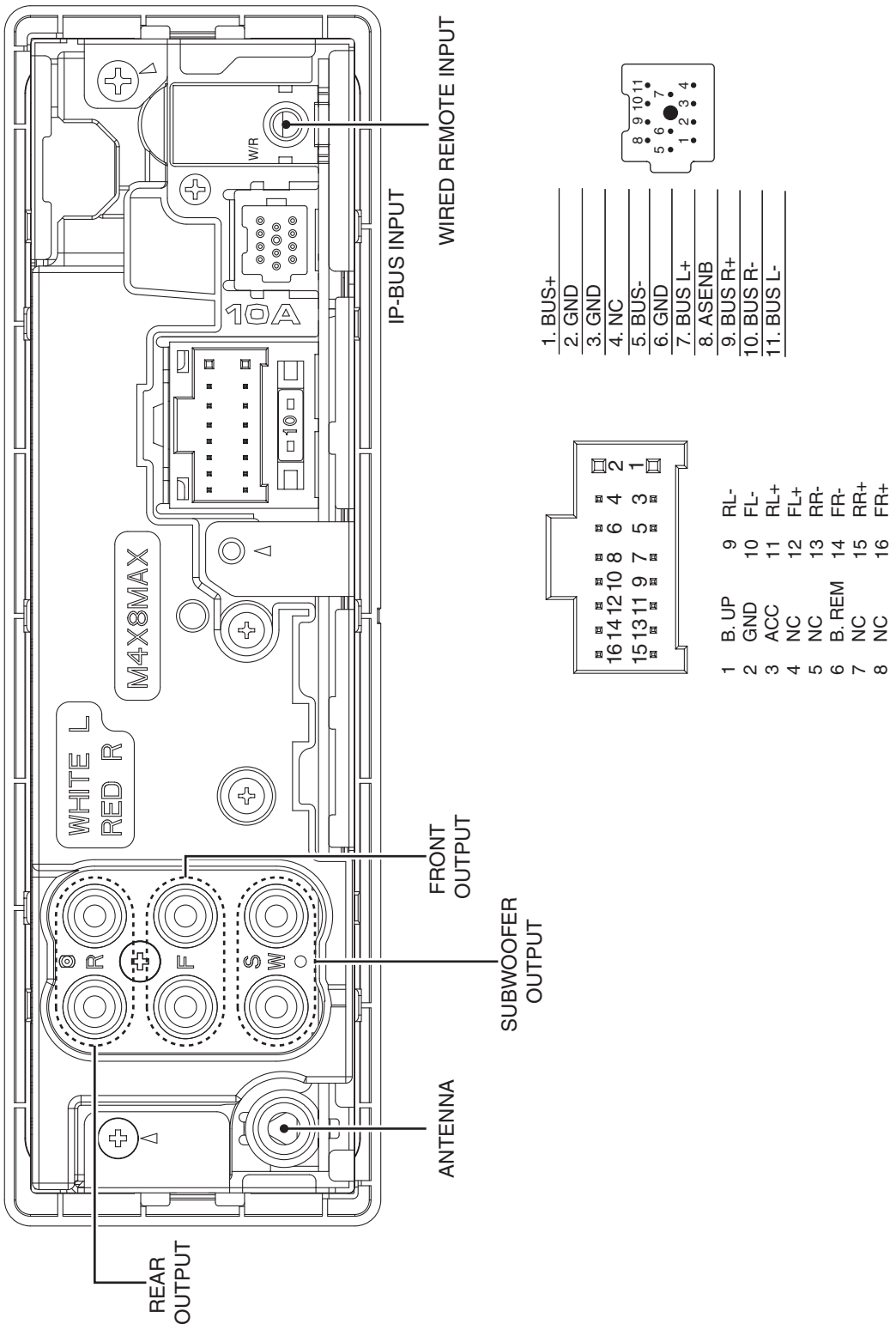
● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.

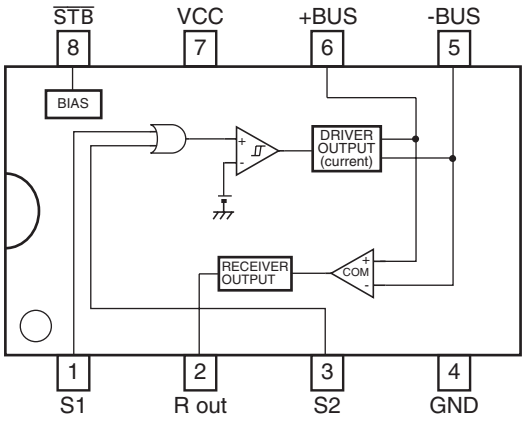


7.1.2 CONNECTOR FUNCTION DESCRIPTION

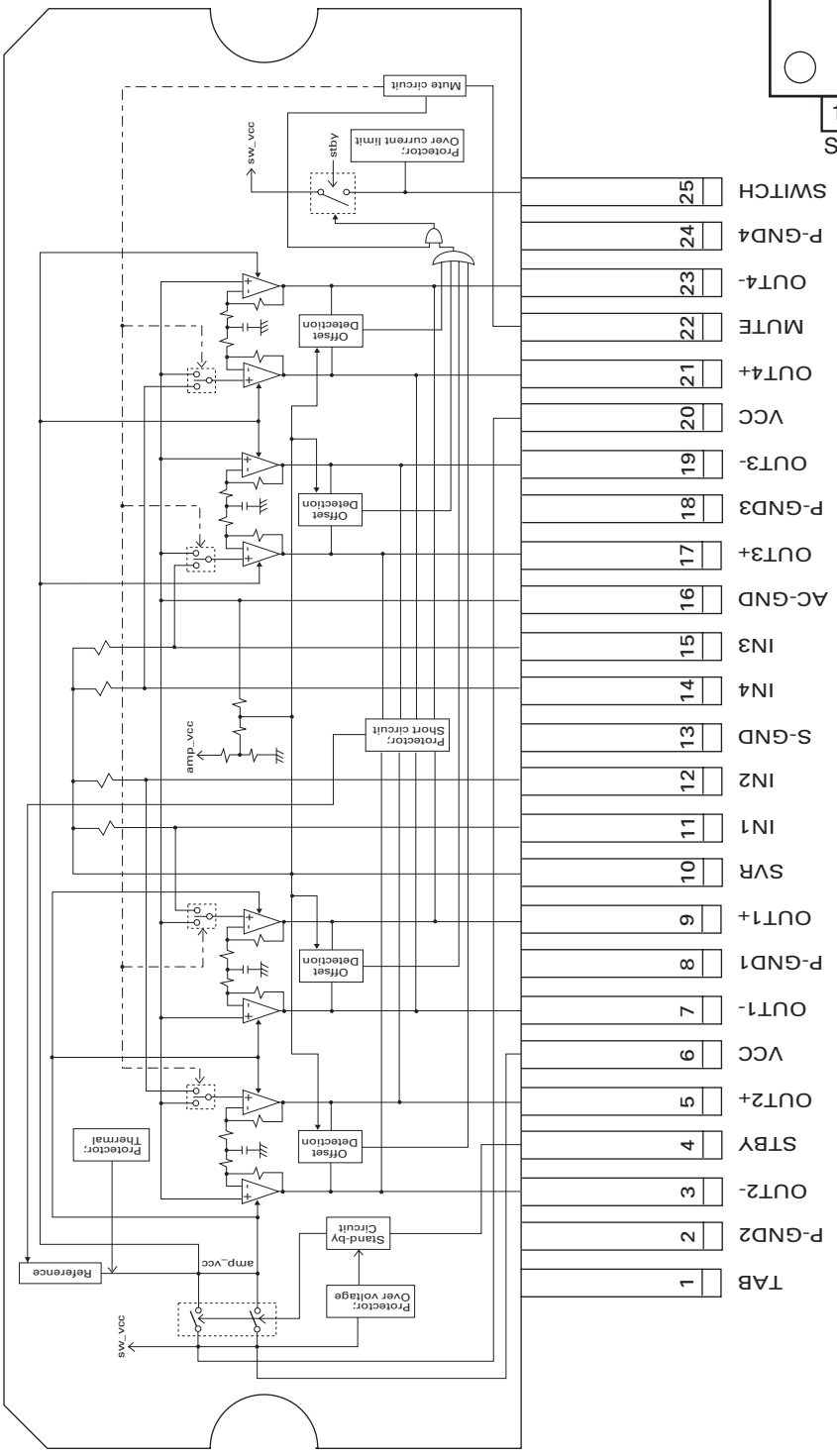


7.2 PARTS
7.2.1 IC

HA12241FP

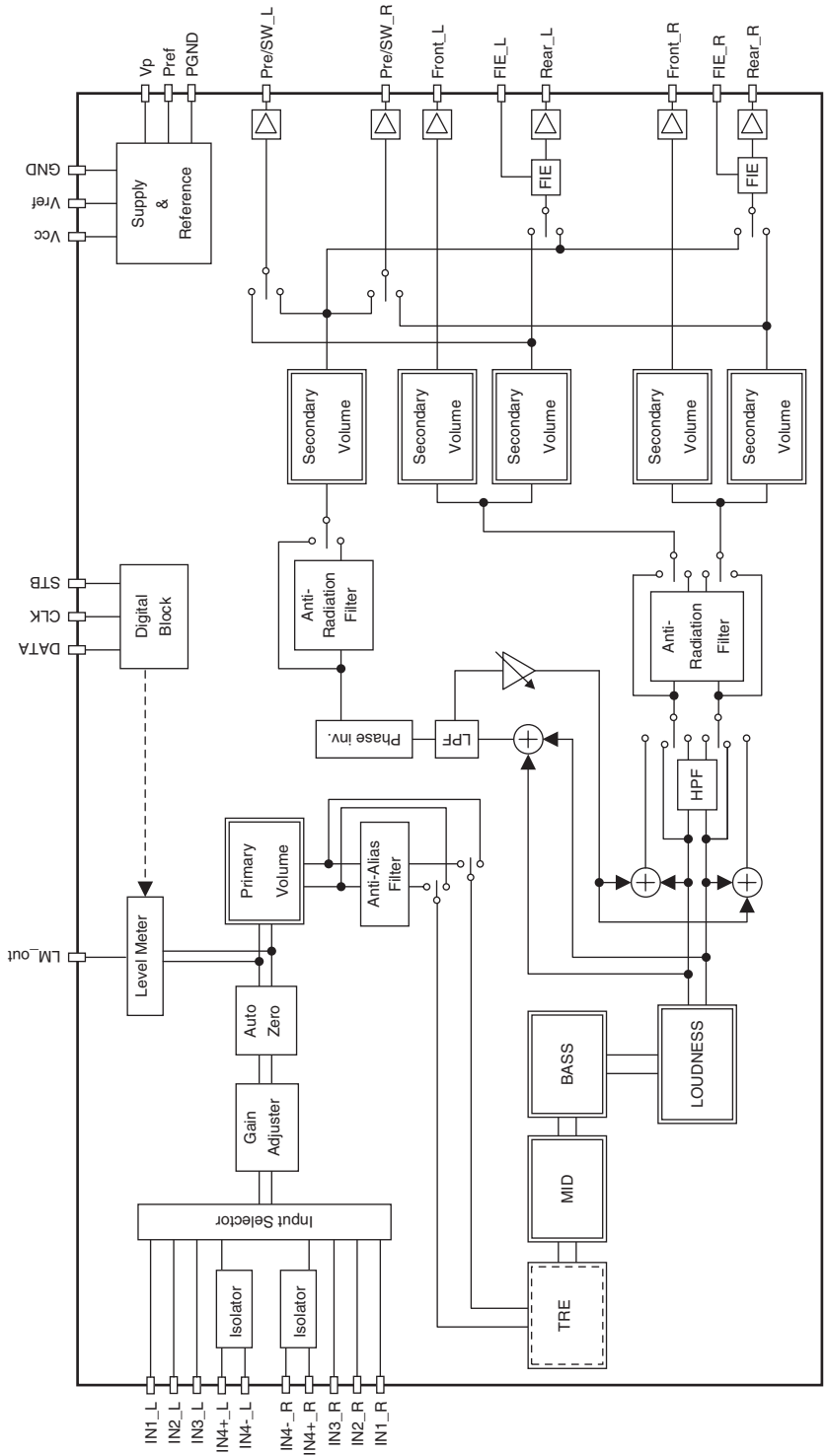


PAL007C

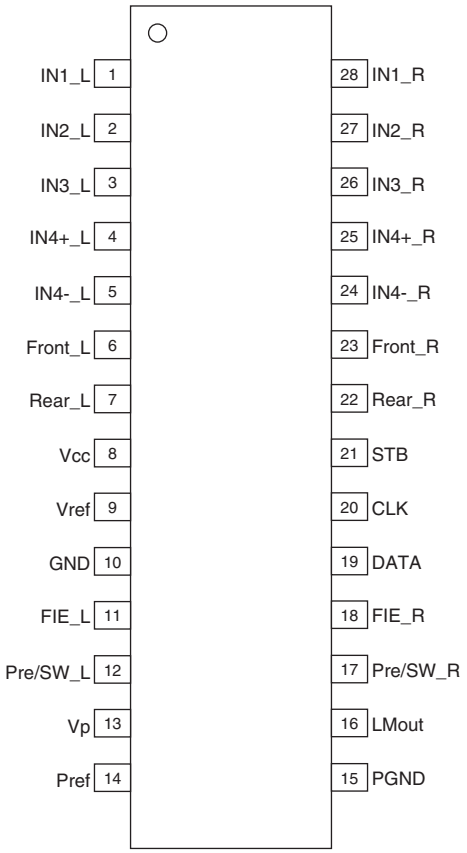


PML015B

● Block Diagram



● Pin Layout

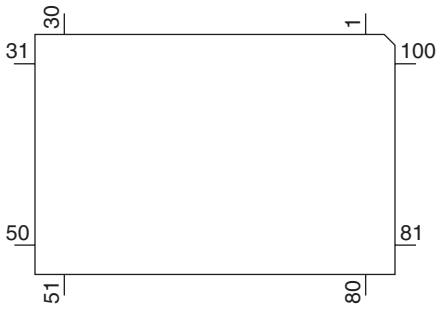


● Pin Functions (PEG286A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	ILMPW	O	C	Illumination power output
2	NC			Not used
3,4	ROT1,0	I		Rotary encoder pulse input 1, 0
5,6	NC			Not used
7	SWVDD	O	C	VDD for display microcomputer
8	BYTE	I		External data bus width change input
9	CNVSS	I		Processor mode change input
10,11	NC			Not used
12	$\overline{\text{RESET}}$	I		Reset input
13	XOUT	O		Main clock output
14	VSS	I		GND
15	XIN	I		Main clock input
16	VCC	I		Power supply input(+)
17	$\overline{\text{NMI}}$	I	C	NMI input
18	$\overline{\text{DSENS}}$	I		Detach sense input
19	$\overline{\text{BSENS}}$	I		Backup sense input
20	$\overline{\text{ASENS}}$	I		ACC sense input
21	$\overline{\text{CD-RESET}}$	O	C	CD mechanism RESET output
22	$\overline{\text{VDCONT}}$	O	C	VD power supply output
23	$\overline{\text{BRST}}$	O	C	P-BUS : Reset output
24	$\overline{\text{BRXEN}}$	I/O	C	P-BUS : Reception enable input/output
25	$\overline{\text{BSRQ}}$	I		P-BUS : Service request input
26	NC			Not used
27	RX2	I		IPBUS : Input 2
28	NC			Not used
29	RX	I		IPBUS : Input
30	TX	O	N	IPBUS : Output
31	BSO	O	C	PBUS : Output
32	BSI	I		PBUS : Input
33	BSCK	O	C	PBUS : Clock output
34	KEYD	I		Not used
35	DPDT	O	C	Display microcomputer communication data output
36	KYDT	I		Display microcomputer communication data input
37,38	NC			Not used
39	PCL	O	C	Output for clock adjustment
40	ASENBO	O	C	IPBUS : Slave ACC sense output
41-46	NC			Not used
47	DALMON	O	C	For consumption current reduction output
48	SYSPW	O	C	System power control output
49-51	NC			Not used
52	IPPW	O	C	IPBUS : Driver power supply control output
53	MUTE	O	C	System mute output
54	VST	O	C	E.VOL strobe output
55	VCK	O	C	E.VOL clock output
56	VDT	O	C	E.VOL data output
57	NC			Not used
58	ROMDATA	I/O	C	ROM correction data input/output
59	ROMCK	O	C	ROM correction clock output
60	ROMCS	O	C	ROM correction chip select output
61	NC			Not used
62	VCC	I		Power supply input(+)
63	NC			Not used
64	VSS	I		GND
65	$\overline{\text{CE2}}$	O	C	TUNER : Chip enable output(EEPROM)
66	CE1	O	C	TUNER : Chip enable output(PLL)

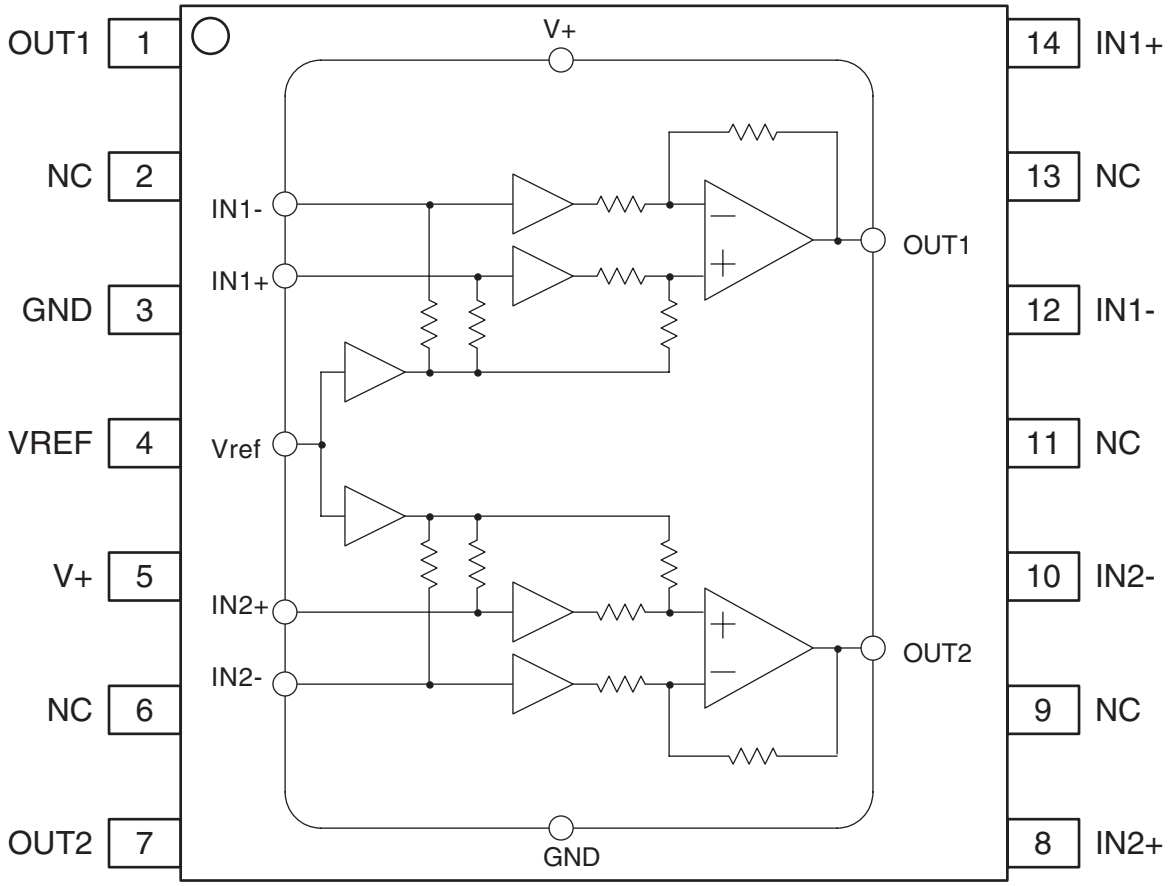
Pin No.	Pin Name	I/O	Format	Function and Operation
67	TUNPCK	O	C	TUNER : Clock output(PLL)
68	TUNPDI	I		TUNER : Data input(PLL)
69-85	NC			Not used
86	TUNPDO	O	C	TUNER : Data output(PLL)
87	NC			Not used
88	TESTIN	I		Test program input
89-91	NC			Not used
92	SSENS			Source key
93	NC			Not used
94	KEYAD	I		Not used
95	MODEL	I		Model select input
96	AVSS	I		A/D converter GND(Connected to VSS)
97	SL			Signal level input(Field intensity)
98	VREF	I		A/D converter reference voltage input
99	AVCC	I		A/D converter power supply input terminal(Connected to VCC)
100	NC			Not used

PEG286A



Format	Meaning
C	CMOS
N	Nch open drain

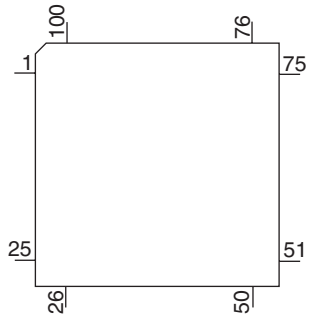
NJM2794V



● Pin Functions (PD6538A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1-39	SEG38-0	O		LCD segment output
40-43	COM3-0	O		LCD common output
44-46	V1-3	O		LCD drive power supply
47	VCC	O		Power supply
48	NC			Not used
49	TXD	O	C	Communication data output
50	RXD	I	C	Communication data input
51,52	MOD0,1			Not used
53	RESET			Reset
54,55	X0,1			Crystal oscillator connection pin
56	VSS			Not used
57	REM	I	C	Remote control input
58,59	NC			Not used
60-63	KDT4-1	O	C	Key data 4-1 output
64-69	KST6-1	O	N	Key strobe 6-1 output
70-100	SEG69-39	O		LCD segment output

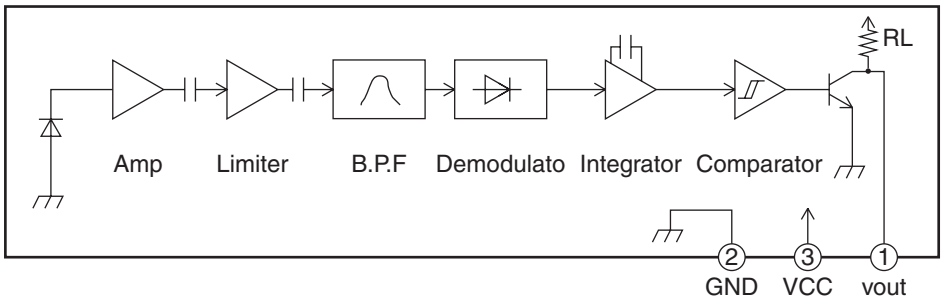
PD6538A



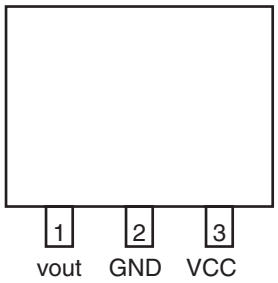
Format	Meaning
C	CMOS
N	Nch open drain

GP1UX51RK

● Block Diagram



● Pin Layout

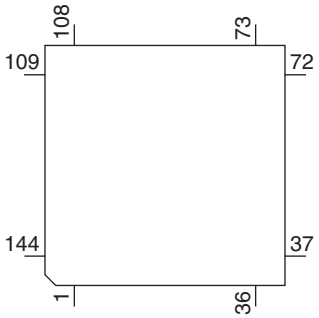


● Pin Functions (PE5547A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	ROMDATA	I/O	/C	E2PROM : Data input/output
2	ROMCK	O	C	E2PROM : Clock output
3	ROMCS	O	C	E2PROM : Chip select output
4	NC			Not used
5	LOEJ	O	C	LOAD/EJECT direction switching output
6	DSCSNS	I		Disc sense input
7	$\overline{8SNS}$	I		8 cm disc detection input
8	$\overline{12SNS}$	I		12 cm disc detection input
9	$\overline{HOME}$	I		HOME SW sense input
10	TEMP			Temperature information sense input
11	VDSENS			VD power supply short circuit/earth fault sense input
12	$\overline{ADENA}$	O	C	A/D reference voltage supply control output
13	ADC.VDD			Power supply for A/D converter
14	ADC.GND			Ground for A/D converter
15	FLMD0	I		Flash writing control terminal
16	$\overline{RESET}$	I		Internal microcomputer reset terminal
17	PULLDOWN	O	C	Pull-down
18	NC			Not used
19	$\overline{TESTIN}$	I		Chip check, test program start-up input
20	NC			Not used
21	BSI	I	N	P-BUS : Serial data input
22	BSO	O	N	P-BUS : Serial data output
23	$\overline{BSCK}$	I/O	N	P-BUS : Serial clock input/output
24	FTxD	O	N	Tx for flash rewriting
25	FRxD	I		Rx for flash rewriting
26	BRXEN	I/O	/C	P-BUS : Reception enable input/output
27	$\overline{BSRQ}$	I/O	/C	P-BUS : Service request input
28	NC			Not used
29	$\overline{FMODE}$	I		Flash self-rewriting mode start-up input
30	FLRQ	O	C	Flash self-rewriting reset voltage control
31	ROM	I		Open(EMPH)
32-36	NC			Not used
37	MCKRQ	O	N	CLOCK request
38	LRCKOK	O	N	LRCK reference enable
39	$\overline{PUEN}$	O	C	Pickup hologram power supply control output
40	CD3VON	O	C	CD + 3.3 V power supply control output
41	CONT	O	C	Servo driver power supply control output
42	VDCONT	O	C	VD power supply control output
43	CLCONT	O	C	CRG/LOAD-EJECT switching control output
44	CDMUTE	O	C	CD mute control output
45	TEST	I		Test terminal
46	$\overline{BRST}$	I		P-BUS : Communication reset input
47	REGS			Capacitor connection for standby
48	C.VDD			Power supply for internal microcomputer
49	C.GND			Ground for internal microcomputer
50	XTAL	I		Connected to the crystal oscillator
51	X.GND			Ground for the crystal oscillator
52	$\overline{XTAL}$	O		Connected to the crystal oscillator
53	X.VDD			Power supply for the crystal oscillator
54	DA.VDD			Power supply for DAC
55	LOUT	O		Output of audio for the left channel
56	DA.GND			Ground for DAC
57	REGC			Connected to the capacitor for band gap
58	DA.GND			Ground for DAC
59	ROUT	O		Output of audio for the right channel

Pin No.	Pin Name	I/O	Format	Function and Operation
60	DA.VDD			Power supply for DAC
61	D.GND			Ground for digital circuits
62	D.VDD			Power supply for digital circuits
63	REG16			Capacitor connection for 1.6 V regulator
64	LRCK	O	C	3-wire audio LR clock output
65	SCKO	O	C	3-wire audio serial I/F clock output
66	DOUT	O	C	3-wire audio serial I/F data output
67-69	SVMON0-2	I/O	/C	Servo monitor input/output 0-2
70	SVMON3	I/O	/C	Servo monitor input/output 3(Ext MCK IN)
71	C33M	O	C	DRAM CLOCK
72	($\overline{RCS}$)	O	C	DRAM CS
73	(CKE)	O	C	DRAM CKE output
74	$\overline{RAS}$	O	C	Output of DRAM RAS
75	$\overline{CAS0}$(LDQM)	O	C	DRAM Lower CAS(LDQM) output
76	$\overline{CAS1}$(UDQM)	O	C	DRAM Upper CAS(UDQM) output
77	$\overline{WE}$	O	C	Output of DRAM WE
78	$\overline{OE}$($\overline{CAS}$)	O	C	DRAM OE(CAS) output
79-94	RDB0-15	I/O	/C	Input/output of DRAM data 0-15
95	IO.GND			Ground for I/O terminal
96	IO.VDD			Power supply for I/O terminal
97-108	RA0-11	O	C	Output of DRAM address 0-11
109	FD	O	C	Output of focus drive PWM
110	TD	O	C	Output of tracking drive PWM
111	SD	O	C	Output of thread drive PWM
112	MD	O	C	Output of spindle drive PWM
113	EFM	O		Output of EFM signals
114	ASY	I		Asymmetry input
115	ATEST	O		Analog tests
116	A.VDD			Power supply for the analog system
117	A.GND			Ground for the analog system
118	RFI	I		Input of RF
119	AGCO	O		Output of RF
120	C3T			Connection to the capacitor for detecting 3T
121	AGCI	I		Input of AGC
122	RFO	O		Output of RF(AGC)
123,124	EQ2,1	I		Equalizer 2, 1
125	RF2-	I		Reversal input of RF2
126	RF-	I		Reversal input of RF
127	A.GND			Ground for the analog system
128	A.VDD			Power supply for the analog system
129	A	I		Input of A
130	B	I		Input of B
131	F	I		Input of F
132	E	I		Input of E
133	REFOUT	O		Output of reference voltage
134	FE-	I		Reversal input of FE
135	FEO	O		Output of FE
136	ADCIN	I		FE,TE A/D converter input
137	TE-	I		Reversal input of TE
138	TEO	O		Output of TE
139	TE2	O		TE2
140	TEC	I		TEC
141	LD	O		Output of LD
142	PD	I		Input of PD
143	AD.VDD			Power supply for servo ADC
144	AD.GND			Ground for servo ADC

PE5547A

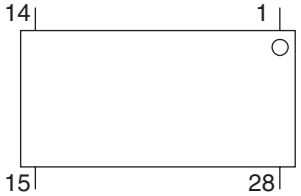


Format	Meaning
C	CMOS
N	Nch open drain

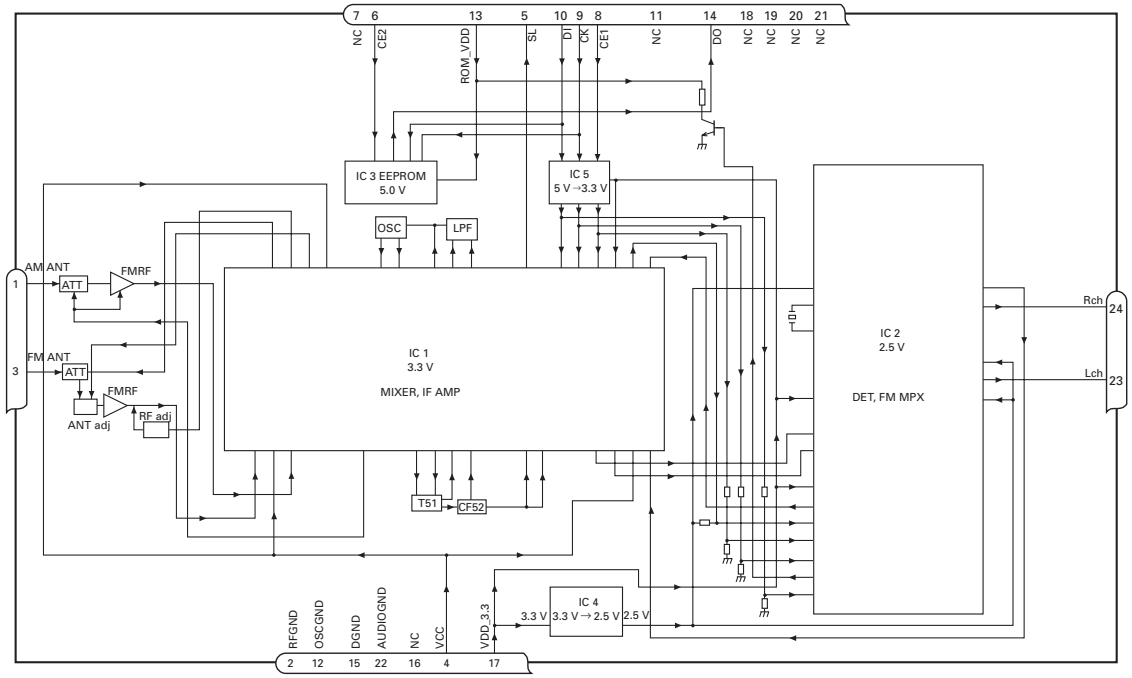
● Pin Functions(BA5839FP)

Pin No.	Pin Name	Function and Operation
1	VR	Input pin for reference voltage
2	OPIN2(+)	Input pin for non-inverting input for CH2 preamplifier
3	OPIN2(-)	Input pin for inverting input for CH2 preamplifier
4	OPOUT2	Output pin for CH2 preamplifier
5	OPIN1(+)	Input pin for non-inverting input for CH1 preamplifier
6	OPIN1(-)	Input pin for inverting input from CH1 preamplifier
7	OPOUT1	Output pin for CH1 preamplifier
8	GND	Ground pin
9	MUTE	Mute control pin
10	POWVCC1	Power supply pin for CH1, CH2, and CH3 at "Power" stage
11	VO1(-)	Driver CH1 - Negative output
12	VO1(+)	Driver CH2 - Positive output
13	VO2(-)	Driver CH2 - Negative output
14	VO2(+)	Driver CH2 - Positive output
15	VO3(+)	Driver CH2 - Positive output
16	VO3(-)	Driver CH2 - Negative output
17	VO4(+)	Driver CH4 - Positive output
18	VO4(-)	Driver CH4 - Negative output
19	POWVCC2	Power supply pin for CH4 at "Power" stage
20	GND	Ground pin
21	CNT	Control pin
22	LDIN	Loading input
23	OPOUTSL	Output pin for preamplifier for thread
24	OPINLSL	Input pin for preamplifier for thread
25	OPOUT3	CH3 preamplifier output pin
26	OPIN3(-)	Input pin for inverting input for CH3 preamplifier
27	OPIN3(+)	Input pin for non-inverting input for CH3 preamplifier
28	PREVCC	PreVcc

BA5839FP



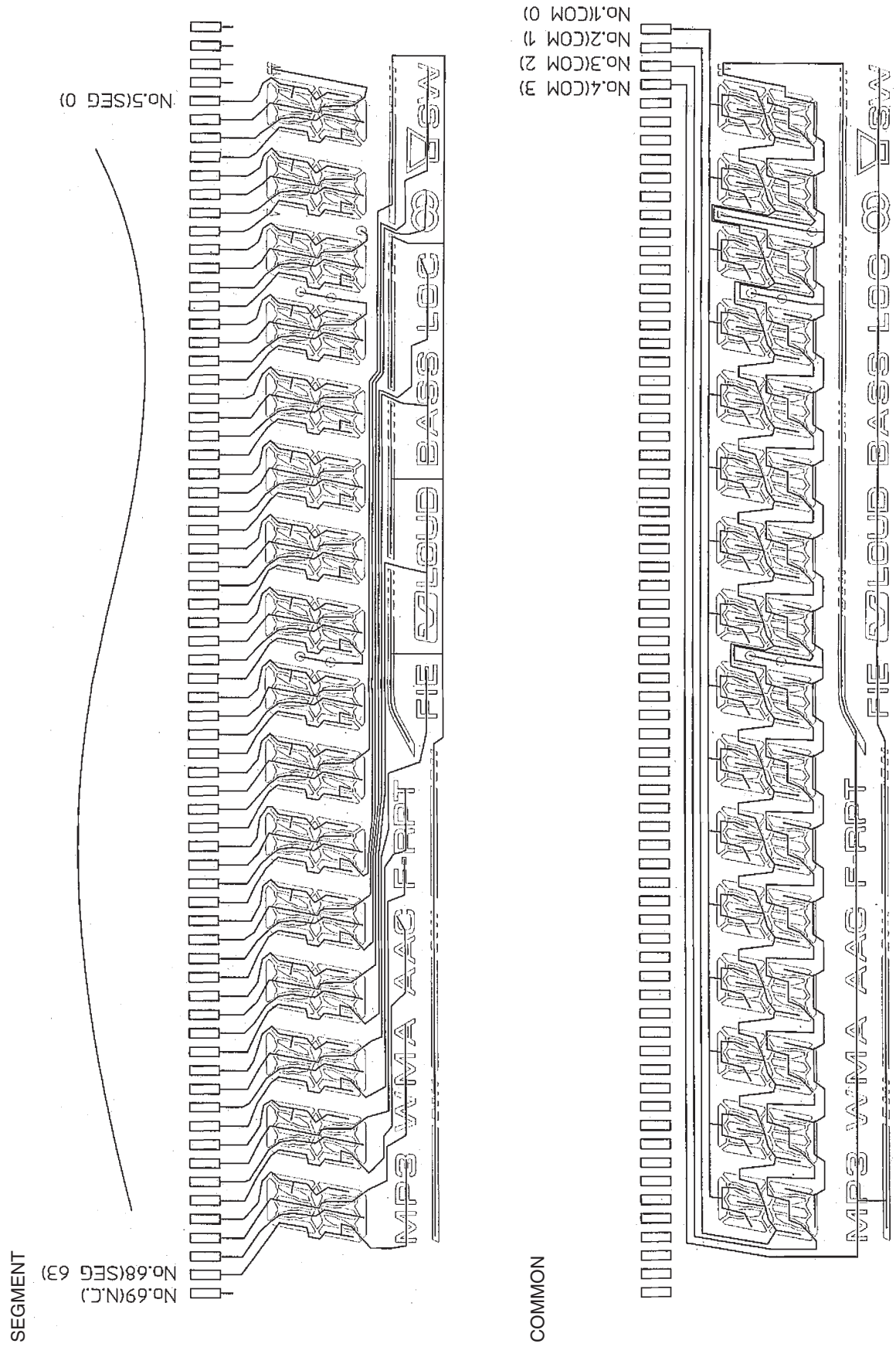
● FM/AM Tuner Unit


7 6 13 5 10 9 8 11 14 18 19 20 21
NC CE2 ROM_VDD SL DI CK CE1 NC DO NC NC NC NC
IC 3 EEPROM 5.0 V
IC 5 5 V→3.3 V
OSC
LPF
AM ANT
FM ANT
ATT
FMRF
ANT adj
RF adj
IC 1 3.3 V MIXER, IF AMP
IC 2 2.5 V DET, FM MPX
Rch
Lch
T51
CF52
IC 4 3.3 V → 2.5 V
3.3 V
2.5 V
RFGND OSCGND DGND AUDIOGND NC VCC VDD_3.3
2 12 15 22 16 4 17

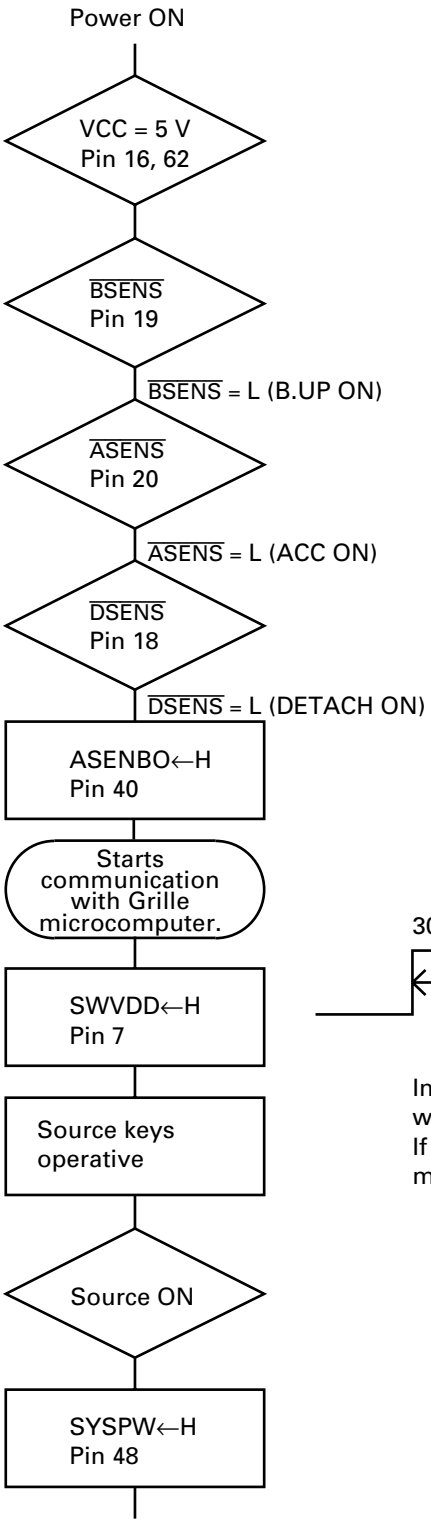
No.	Symbol	I/O	Explain	
1	AMANT	I	AM antenna input	AM antenna input high impedance AMANT pin is connected with an all antenna by way of 4.7 μH. (LAU type inductor)A series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the hum of power transmission line.
2	RFGND		RF ground	Ground of antenna block
3	FMANT	I	FM antenna input	Input of FM antenna 75 Ω Surge absorber(DSP-201M-S00B)is necessary.
4	VCC		power supply	The power supply for analog block. D.C 8.4 V± 0.3 V
5	SL	O	signal level	Output of FM/AM signals level
6	CE2	I	chip enable-2	Chip enable for EEPROM "Low" active
7	NC		non connection	Not used
8	CE1	I	chip enable-1	Chip enable for AF•RF "High" active
9	CK	I	clock	Clock
10	DI	I	data in	Data input
11	NC		non connection	Not used
12	OSCGND		osc ground	Ground of oscillator block
13	ROM_VDD		power supply	Power supply for EEPROM pin 13 is connected with a power supply of micro computer.
14	DO	O	data out	Data output
15	DGND		digital ground	Ground of digital block
16	NC		non connection	Not used
17	VDD_3.3		power supply	The power supply for digital block. 3.3 V ± 0.2 V
18	NC		non connection	Not used
19	NC		non connection	Not used
20	NC		non connection	Not used
21	NC		non connection	Not used
22	AUDIOGND		audio ground	Ground of audio block
23	L ch	O	L channel output	FM stereo "L-ch" signal output or AM audio output
24	R ch	O	R channel output	FM stereo "R-ch" signal output or AM audio output

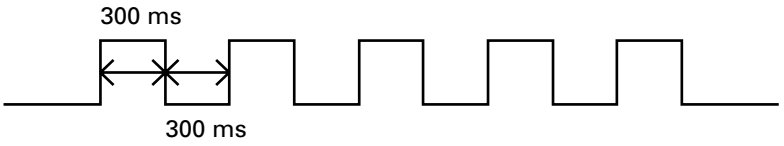
7.2.2 DISPLAY

● **LCD(YAW5080)**



7.3 OPERATIONAL FLOW CHART

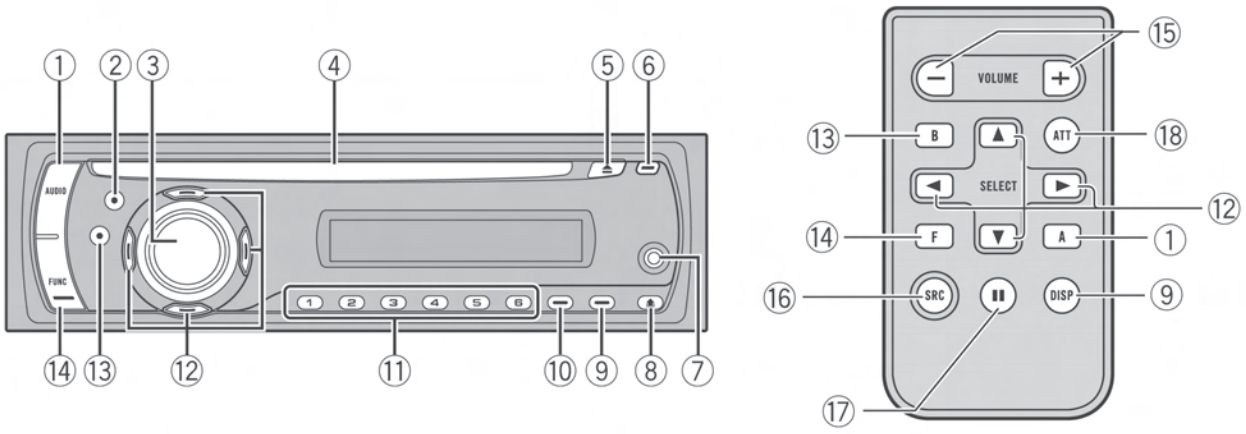




In case of the above signal, the communication with Grille microcomputer may fail.
If the time interval is not 300 msec, the oscillator may be defective.

Completes power-on operation.
(After that, proceed to each source operation)

8. OPERATIONS



Head unit

① **AUDIO button**
Press to select various sound quality controls.

② **EQ button**
Press to select various equalizer curves.

③ **SOURCE button, VOLUME**
This unit is turned on by selecting a source.
Press to cycle through all the available sources.
Rotate it to increase or decrease the volume.

④ **Disc loading slot**
Insert a disc to play.

⑤ **EJECT button**
Press to eject a CD from your built-in CD player.

⑥ **CLOCK button**
Press to change to the clock display. Press and hold to change the channel select mode when XM tuner or SIRIUS tuner is selected as the source.

⑦ **AUX1 input jack (3.5 mm stereo jack)**
Use to connect an auxiliary equipment.

⑧ **DETACH button**
Press to remove the front panel from the head unit.

⑨ **DISPLAY button**
Press to select different displays.

⑩ **SW button**
Press to select the subwoofer setting menu.
Press and hold to select the bass boost setting menu.

⑪ **1 to 6 buttons**
Press for preset tuning and disc number search when using a multi-CD player.

⑫ **▲/▼/◄/► buttons**
Press to perform manual seek tuning, fast forward, reverse and track search controls.
Also used for controlling functions.

⑬ **BAND button**
Press to select among three FM bands and one AM band and to cancel the control mode of functions.

⑭ **FUNCTION button**
Press to select functions.

Remote control

Operation is the same as when using the buttons on the head unit. See the explanation of the head unit about the operation of each button with the exception of **ATT** and **PAUSE**, which is explained below.

⑮ **VOLUME button**
Press to increase or decrease the volume.

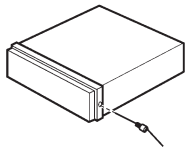
⑯ **SOURCE button**
This unit is turned on by selecting a source. Press to cycle through all the available sources.

⑰ **PAUSE button**
Press to turn pause on or off.

⑱ **ATT button**
Press to quickly lower the volume level, by about 90%. Press once more to return to the original volume level.

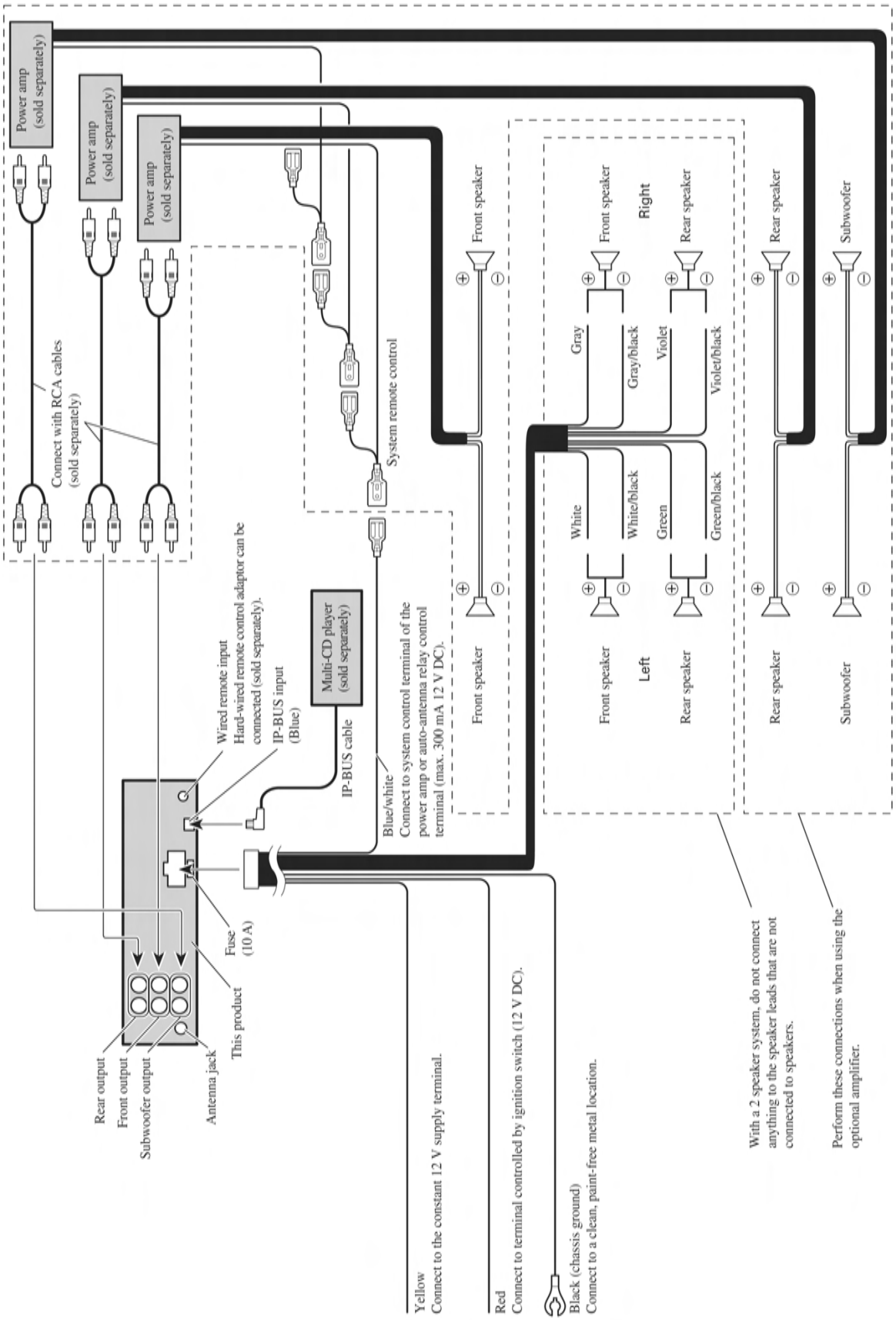
Fastening the front panel

If you do not plan to detach the front panel, the front panel can be fastened with supplied screw.



Screw
(BPZ20P080FTC)

● Connection Diagram



● Jigs List

Name	Jig No.	Remarks
Test Disc	TCD-782	Checking the grating
L.P.F.		Checking the grating (Two pieces)

● Grease List

Name	Grease No.	Remarks
Grease	GEM1024	CD Mechanism Module
Grease	GEM1045	CD Mechanism Module

Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

Pioneer sound.vision.soul

Service Manual

ORDER NO.
CRT3815

CD MECHANISM MODULE(S10.5COMP2)

CX-3195

This service manual describes the operation of the CD mechanism module incorporated in models listed in the table below.
When performing repairs use this manual together with the specific manual for model under repair.

Model	Service Manual	CD Mechanism Module
DEH-2900MP/XN/EW5 DEH-2920MP/XN/EW5 DEH-2900MPB/XN/EW5 DEH-2910MP/XN/UR	CRT3802	CXK5760
DEH-2950MP/XN/ES DEH-2950MP/XN/ES1 DEH-2990MP/XN/ID	CRT3820	CXK5760
DEH-P390MP/XU/UC DEH-P3900MP/XU/UC	CRT3816	CXK5760
DEH-P4950MP/XU/ES DEH-P4950MP/XU/CN5	CRT3817	CXK5760
DEH-P2900MP/XU/UC	CRT3823	CXK5760
DEH-P3950MP/XU/ES DEH-P3950MP/XU/CN5	CRT3824	CXK5760
DEH-P5900MP/XU/EW5	CRT3828	CXK5760

Model	Service Manual	CD Mechanism Module
DEH-3900MP/XN/EW5	CRT3804	CXK5760
DEH-3990MP/XN/ID	CRT3829	CXK5760
DEH-P40MP/XU/EW5	CRT3834	CXK5760
DEH-P4950MP/XU/ES	CRT3835	CXK5760
DEH-P490IB/XN/UC DEH-P4900IB/XN/UC	CRT3846	CXK5760
DEH-P4900IB/XN/EW5	CRT3847	CXK5760
DEH-P5950IB/XN/ES DEH-P5950IB/XN/ES1 DEH-P5990IB/XN/ID	CRT3848	CXK5760
DEH-P590IB/XN/UC DEH-P5900IB/XN/UC	CRT3851	CXK5760
DEH-P6900IB/XN/EW5	CRT3852	CXK5760
DEH-P6950IB/XN/ES DEH-P6950IB/XN/ES1	CRT3853	CXK5760

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936
ⓒ**PIONEER CORPORATION 2006**

K-ZZA. OCT. 2006 Printed in Japan

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3. DISASSEMBLY 22

1. CIRCUIT DESCRIPTIONS

The recent mainstay of the CD LSI is the LSI integrating the core DSP with DAC or RF amplifier, which are generally employed as peripheral circuits, however, PE5547A, used in this product, is an LSI integrating the afore-mentioned LSI unit and microcomputer unit in one chip.

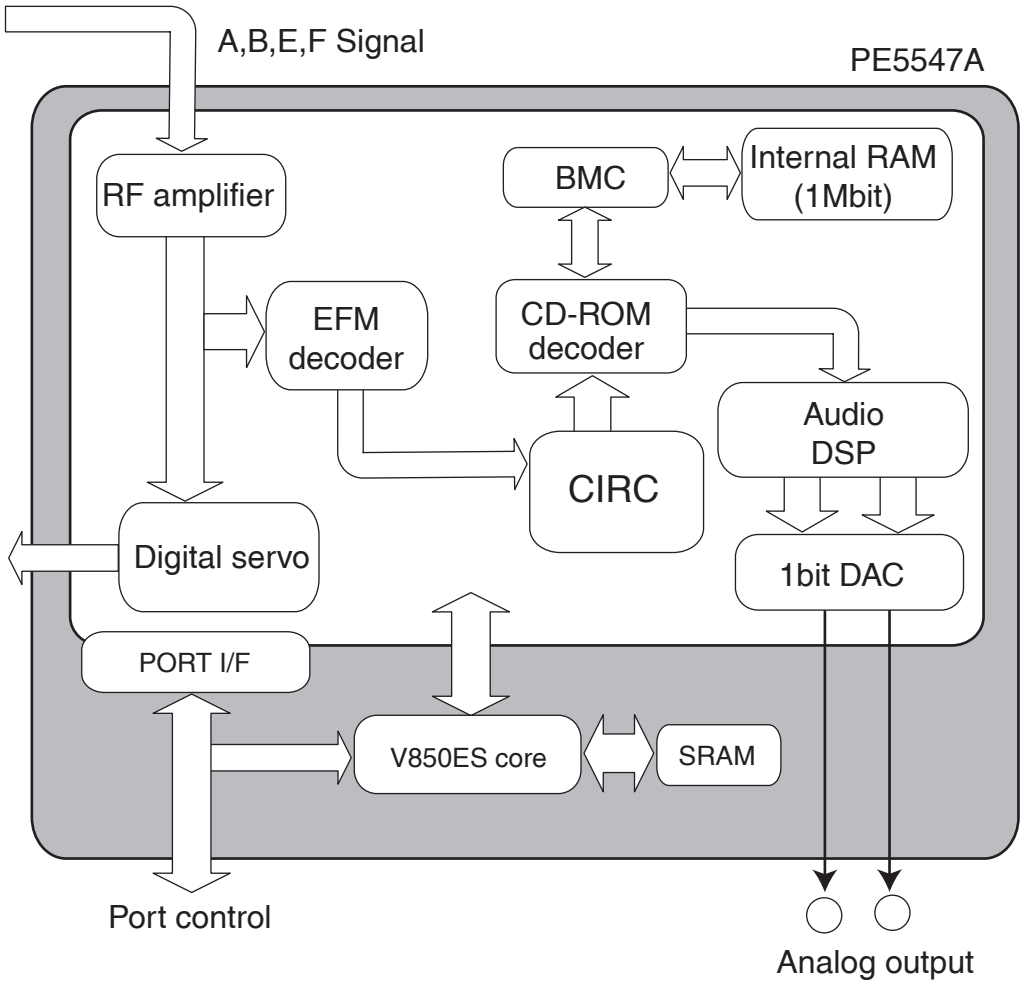


Fig.1.0.1 Block diagram of CD LSI PE5547A

1.1 PREAMPLIFIER BLOCK

In the preamplifier block, the pickup output signals are processed to generate signals that are used in the subsequent blocks: servo, demodulator, and control blocks. Signals from the pickup are I/V converted in the pickup with the preamplifier with built-in photo detectors, and after added with the RF amplifier, they are used to produce such signals as RF, FE, TE, and TE zero-cross signals. The preamplifier block is built in CD LSI PE5547A (IC201), whose parts are described individually below. Incidentally, as this LSI employs a single power supply (+ 3.3 V) specification, the reference voltages of this LSI and the pickup are the REFO (1.65 V) for both. The REFO is an output obtained from REFOUT in the LSI via the buffer amplifier, and is output from the pin 133 of this LSI. All measurements will be performed with this REFO as the reference.

Caution: Be careful not to short-circuit the REFO and GND when measuring.

1.1.1 APC (Automatic Power Control) circuit

Since laser diodes have extremely negative temperature characteristics in optical output when driven in constant current, it is necessary to control the current with the monitor diodes in order to keep the output constant. This is the feature of the APC circuit. The LD current is obtained by measuring the voltage between LD1 and V3R3, and divide the value by 7.5 (ohms), which becomes about 30 mA. The voltage between LD1 and V3R3 is set to about 225 mV.

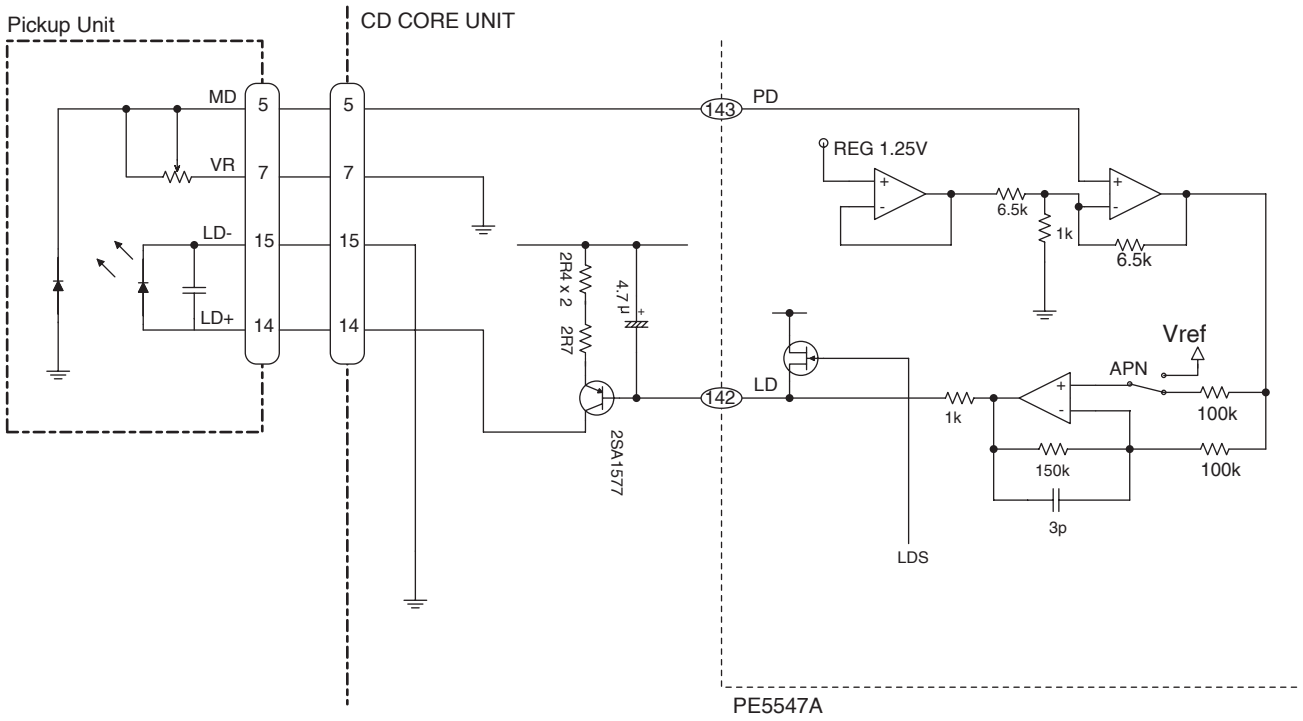


Fig.1.1.1 APC

1.1.2 RF and RFAGC amplifiers

The output from the photo-detector (A + C) and (B + D) is provided from the RFO terminal as the RF signal (which can be used for eye-pattern check), after it is added, amplified, and equalized inside this LSI. The low frequency component of the voltage RFO is calculated as below.

RFO = (A + B + C + D) x 2

The RFO is used for the FOK generation circuit and RF offset adjustment circuit.

The RFO signal, output from the pin 122, is A/C-coupled externally, input to the pin 121, and amplified in the RFAGC amplifier to obtain the RFAGC signal.

Also, this LSI is equipped with the RFAGC auto-adjustment function, explained below, which switches feedback gains of the RFAGC amplifier so that the RFO output will be 1.5 V.

This RFO signal is also used for the EFM, DFCT, MIRR, and RFAGC auto-adjustment circuits.

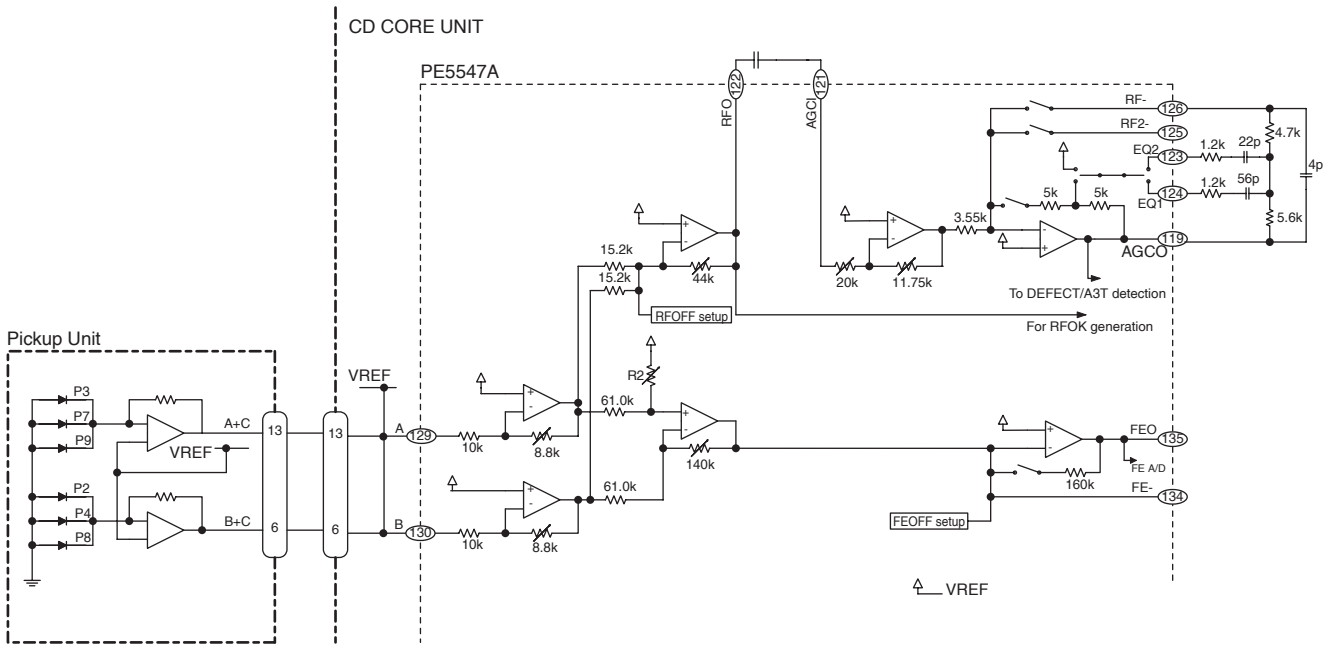


Fig.1.1.2 RF/AGC/FE

1.1.3 Focus error amplifier

The photo-detector outputs (A + C) and (B + D) are passed through the differential amplifier and the error amplifier, and (A + C - B - D) is provided from the pin 135 as the FE signal. The low frequency component of the voltage FE is calculated as below.

FE = (A + C - B - D) x 8.8k / 10k x 111k / 61k x 160k / 72k

= (A + C - B - D) x 3.5

For the FE outputs, an S-shaped curve of 1.5 Vp-p is obtained with the REFO as the reference. The cutoff frequency for the subsequent stage amplifiers is 14.6 kHz.

1.1.4 RFOK circuit

This circuit generates the RFOK signal, which indicates the timing to close the focus loop and focus-close status during the play mode, from the pin 70. As for the signal, "H" is output in closing the focus loop and during the play mode.

Additionally, the RFOK becomes "H" even in a non-pit area, since the DC level of the RFO signal is peak-held in the subsequent digital block and compared at a certain threshold level to generate the RFOK signal. Therefore, the focus is closed even on a mirror-surface area of a disc. This signal is also supplied to the microcomputer via the low-pass filer as the FOK signal, which is used for protection and gain switching of the RF amplifier.

1.1.5 Tracking error amplifier

The photo-detector outputs E and F are passed through the differential amplifier and the error amplifier to obtain (E - F), and then provided from the pin 138 as the TE signal. The low frequency component of the voltage TE is calculated as below.

TEO = (E - F) x 63k / 112k x 160k / 160k x 181k / 45.4k x 160k / 80k

= (E - F) x 4.48

For the TE output, TE waveform of about 1.3 Vp-p with the REFO as the reference. The cutoff frequency in the subsequent is 21.1 kHz.

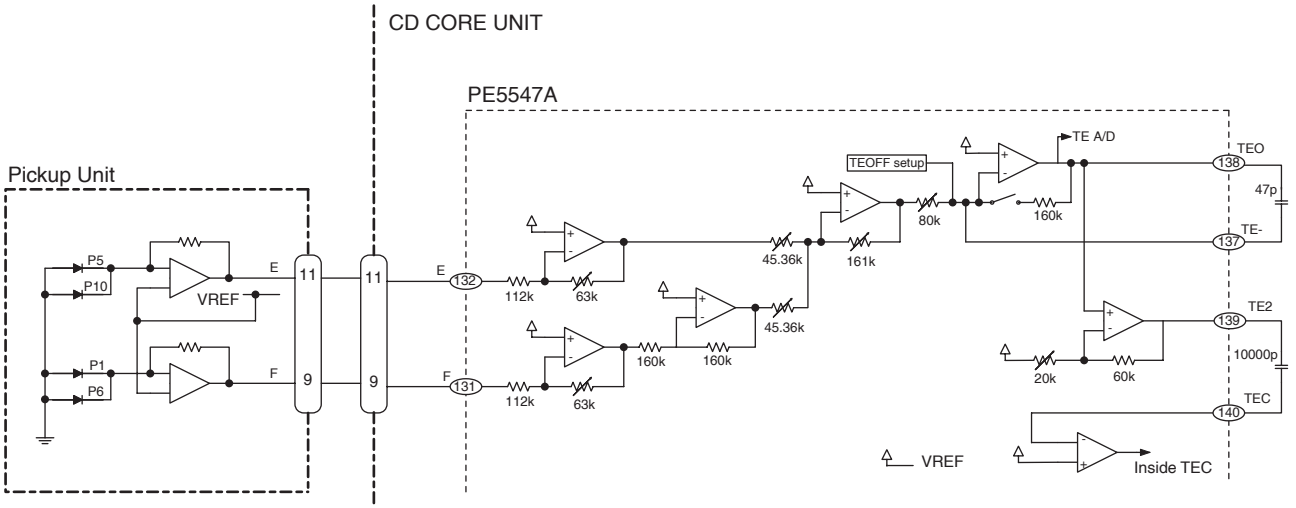


Fig.1.1.3 TE

1.1.6 Tracking zero-cross amplifier

The tracking zero-cross signal (hereinafter referred to as TEC signal) is obtained by amplifying the TE signal by fourfold, and used to detect the tracking-error zero-cross point. As the purpose of detecting the zero-cross point, the following two points can be named:

1. To use for track-counting in the carriage move and track jump modes
2. To use for detecting the direction in which the lens moves in tracking close. (Used in the tracking brake circuit to be explained later.)

The frequency range of the TEC signal is from 300 Hz to 20 kHz, and

TEC voltage = TE level x 4

The TEC level can be calculated at 4.62 V, which, at this level, exceeds the D range of the operational amplifier, and clips the signal, but, because the CD LSI only uses the signal at the zero-cross point, it poses no particular problem.

1.1.7 EFM circuit

The EFM circuit converts the RF signal into digital signals of 0 and 1. The AGCO signal output from the pin 119 is A/C-coupled externally, input to the pin 118, and supplied to the EFM circuit.

Missing RF signal due to scratches and stains on the disc, and asymmetry of the upper and lower parts of the RF, caused by variation in disc production, cannot be entirely eliminated in AC coupling process, the reference voltage ASY of the EFM comparator is controlled, using the probability that 0 and 1 occur at 50%. Thus, the comparator level will always stay around the center of the RFO signal. This reference voltage ASY is generated by passing the EFM comparator output through the low-pass filter. The EFM signal is output from the pin 113.

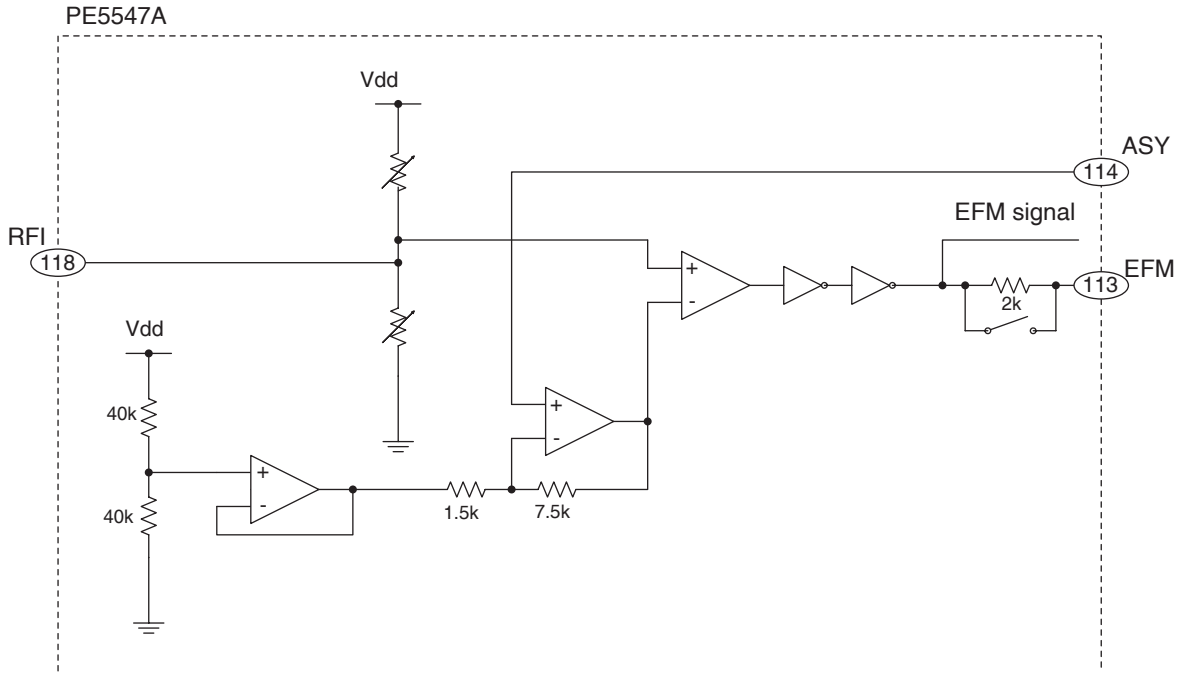


Fig.1.1.4 EFM

1.2 SERVO BLOCK (PE5547A: IC201)

The servo block performs servo control such as error signal equalizing, in-focus, track jump and carriage move. The DSP block is the signal-processing unit, where data decoding, error correction, and compensation are performed. The FE and TE signals, generated in the preamplifier stage, are A/D-converted, and output drive signals for the focus, tracking, and carriage systems via the servo block. Also, the EFM signal is decoded in the signal-processing unit, and ends up in outputting D/A-converted audio signals through the D/A converter. Furthermore, in this decoding process, the spindle servo error signal is generated, supplied to the spindle servo block, and used to output the spindle drive signal.

Each drive signal for focus, tracking, carriage, and spindle servos (FD, TD, SD, and MD) are output as PWM3 data, and then converted to analog data through the LPF. These drive signals, after changed to analog form, can be monitored with the FIN, TIN, CIN, and SIN signals, respectively. Subsequently, the signals are amplified and supplied to the actuator and motor for each signal.

1.2.1 Focus servo system

The main equalizer of the focus servo consists of the digital equalizer block. The figure 1.2.1 shows the block diagram of the focus servo system.

In the focus servo system, it is necessary to move the lens within the in-focus range in order to close the focus loop. For that purpose, the in-focus point is looked for by moving the lens up and down with the focus search voltage of triangular signal. During this time, the rotation of the spindle motor is retained at a certain set speed by kicking the spindle motor.

The servo LSI monitors the FE and RFOK signals and automatically performs the focus-close operations at an appropriate timing. The focus-close operation is performed when the following three conditions are satisfied at the same time:

1) The lens moves toward the disc surface.
2) RFOK = "H"
3) The FE signal is zero-crossed.

Consequently, the FE converges to "0" (= REFO).

When the above-mentioned conditions are met and the focus loop is closed, the FSS bit is shifted from "H" to "L," and then, in 10 ms, the CPU of the LSI starts monitoring the RFOK signal obtained through the low-pass filter.

If the RFOK signal is determined to be "L," the CPU of the LSI takes several actions including protection.

Fig.1.2.2 shows a series of actions concerning the focus close operations. (It shows a case where the focus loop cannot be closed.)

With the focus mode selector displaying 01 in the test mode, pressing the focus close button, allows to check the S-shaped curve, search voltage, and actual lens behavior.

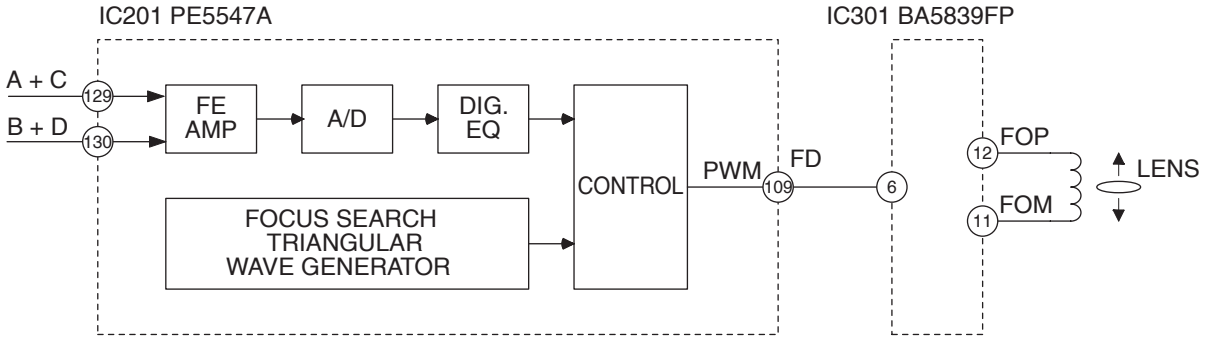


Fig.1.2.1 Block diagram of the focus servo system

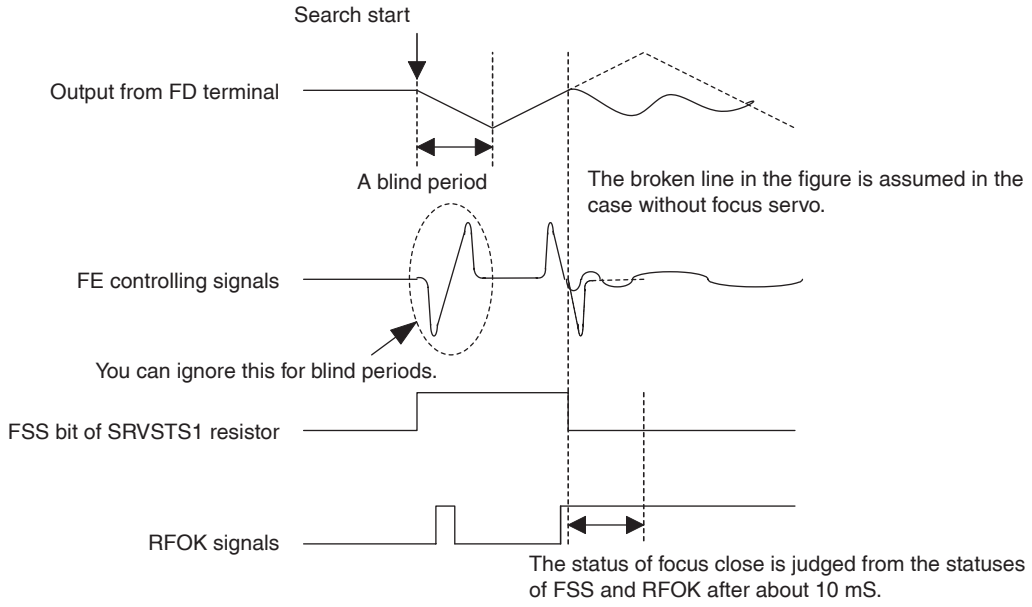

Search start
Output from FD terminal
A blind period
The broken line in the figure is assumed in the case without focus servo.
FE controlling signals
You can ignore this for blind periods.
FSS bit of SRVSTS1 resistor
RFOK signals
The status of focus close is judged from the statuses of FSS and RFOK after about 10 mS.

Fig.1.2.2 Timing chart for focus close operations

1.2.2 Tracking servo system

The main equalizer of the tracking servo consists of the digital equalizer block. The figure 1.2.3 shows the block diagram of the tracking servo system.

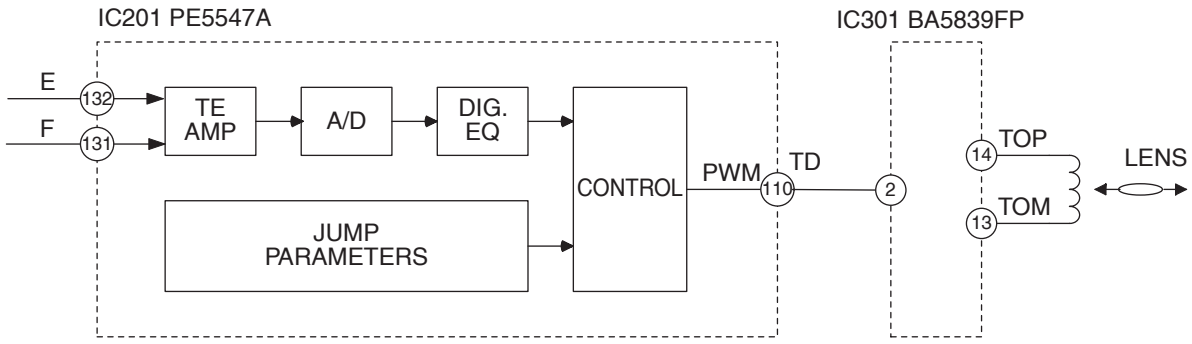


Fig.1.2.3 Block diagram of the tracking servo system

(a) The track jump operation is automatically performed by the auto-sequence function inside the LSI with a command from the CPU of the LSI. For the track jumps used in the search mode, a single track jump and four to 100 multi-track jump are available in this system. In the test mode, out of these track jumps, 1, 32, and 32 * 3 track jumps, as well as carriage move can be performed and checked in mode selection. In a track jump, the CPU of the LSI sets about half the number of the total tracks to jump (about five tracks for a 10-track jump), and the set number of tracks are counted using the TEC signal. By outputting the brake pulse for a certain period of time (set by the CPU of the LSI) from the time the set number is counted, and stopping the lens, the tracking loop can be closed so that the normal play can be continued.

Also, in order to facilitate closing of the tracking loop in a track jump, the brake circuit is kept ON for 50 msec, after the brake pulse is stopped, for increasing the tracking servo gain. The FF/REW action in the normal operation mode is realized by performing single jumps consecutively. The speed is approximately 10 times faster than in the normal mode.

(b) Brake circuit

Since the servo loop is not closed very well in the setup mode and track jump mode, the brake circuit is used for stabilizing the servo-loop close operation. The brake circuit detects the direction in which the lens moves, and outputs only the drive signal for the direction opposite to the movement to slow down the lens, thereby stabilizing the tracking servo-loop close operation. Additionally, the off-track direction is determined from the TEC and MIRR signals, as well as their phase relation.

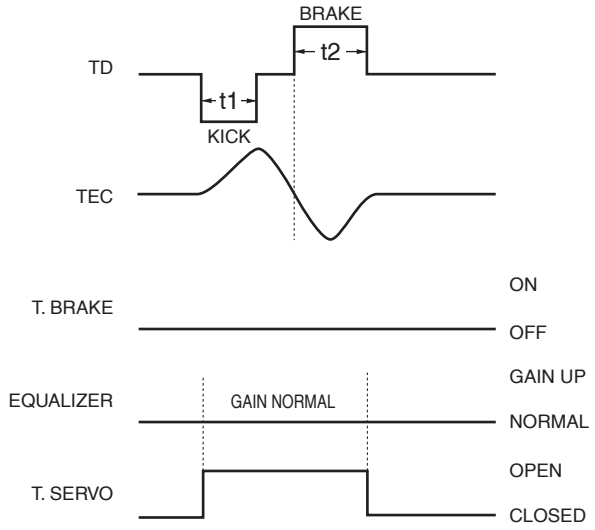


Fig.1.2.4 Single-track jump

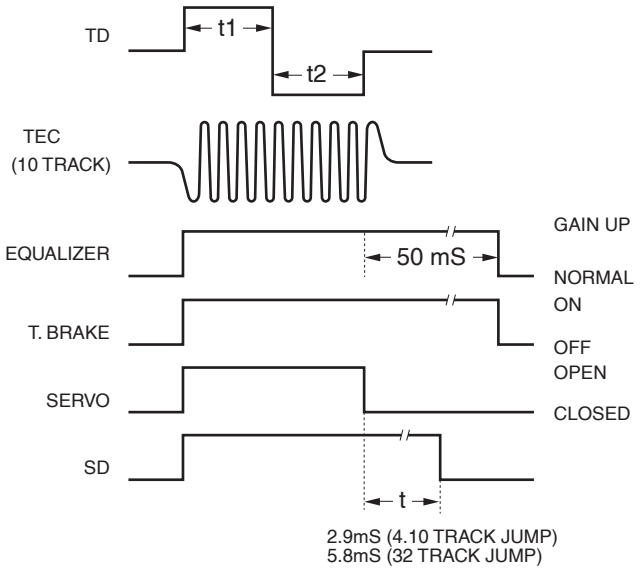
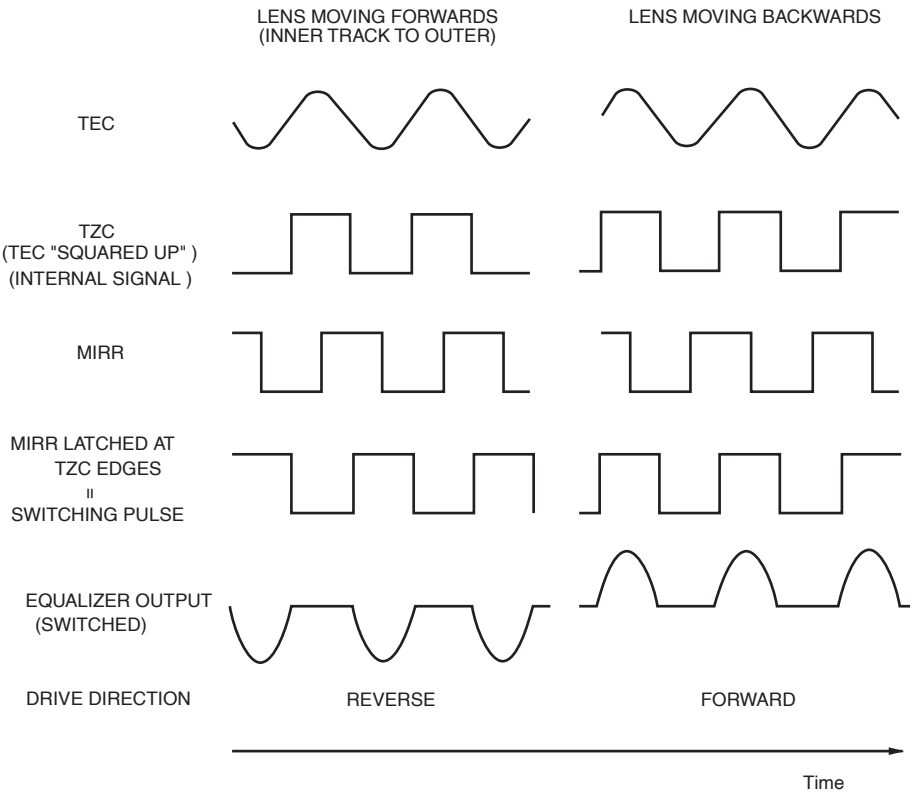


Fig.1.2.5 Multi-track jump



Note : Equalizer output assumed to hava same phase as TEC.

Fig.1.2.6 Track brake

1.2.3 Carriage servo system

The carriage servo system inputs the output of the low frequency component from the tracking equalizer (information on the lens position) to the carriage equalizer, and, after the gain is increased to a certain level, outputs the drive signal from the CD of the LSI. This signal is applied to the carriage motor via the driver IC.

Specifically, since it is necessary to move the whole pickup to the FORWARD direction when the lens offset reaches a certain level during the play mode, the equalizer gain is set to output higher voltage than the carriage motor starting voltage at this time. In actual operations, a certain threshold level is preset in the servo LSI for the equalizer output, and only when it exceeds the threshold level, the drive voltage will be output. This can reduce the power consumption. Also, before the whole pickup starts moving, the equalizer output voltage may exceed the threshold level a few times, due to such causes as eccentricity of discs. In this case, the output waveform of the drive voltage from the LSI assumes a pulse-like form.

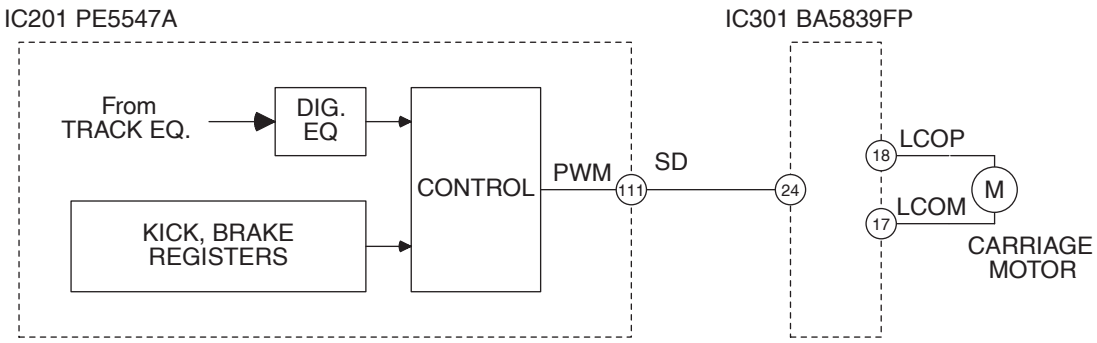


Fig.1.2.7 Block diagram for the carriage servo block

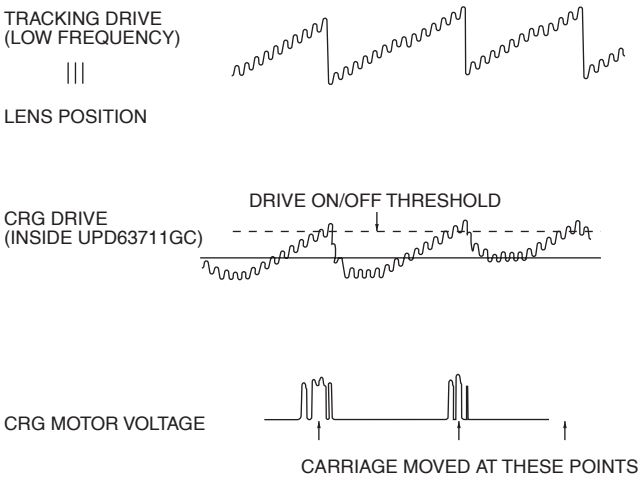


Fig.1.2.8 Waveforms of the carriage signal

1.2.4 Spindle servo system

In the spindle servo system, the following modes are available:

1) Kick

Used to accelerate the disc rotation in the setup mode.

2) Offset

a. Used in the setup mode after the kick mode, until the TBAL adjustment is completed.

b. Used during the play mode when the focus loop is unlocked, until it is locked again.

In both cases, the mode is used to keep the disc rotation approximately normal.

3) Applicable servo

CLV servo mode, used in the normal operation.

In the EFM demodulation block, by WFCK/16 sampling whether the frame sync signal and the internal frame counter output are synchronized, a signal is created to show if they are "in-sync" or "non-sync." The status is not recognized as asynchronous until the signal is "non-sync" for eight consecutive times; otherwise it is recognized as synchronous. In the applicable servo mode, the leading-in servo mode is automatically selected in the asynchronous status, and the normal servo mode in the synchronous status.

4) Brake

Used to stop the spindle motor.

In accordance with the CPU of the LSI command, the brake voltage is sent out from the servo LSI. At this time, the EFM waveform is monitored in the LSI, and when the longest EFM pattern exceeds a certain interval (or the rotation slows down enough), a flag is set inside the CD of the LSI, and the CPU of the LSI switches off the brake voltage. If a flag is not set within a certain period, the CPU of the LSI shifts the mode from the brake mode to the stop mode, and retains the mode for a certain period of time. If the mode switches to this stop mode in the eject operation, the disc will be ejected after the period of time mentioned above elapses.

5) Stop

Used when the power is turned on and during the eject operation. In the stop mode, the voltage in both ends of the spindle motor is 0 V.

6) Rough servo

Used in carriage feed (carriage move mode such as long search).

By obtaining the linear velocity from the EFM waveform, the "H" or "L" level is input to the spindle equalizer. In the test mode, this mode is also used for grating confirmation.

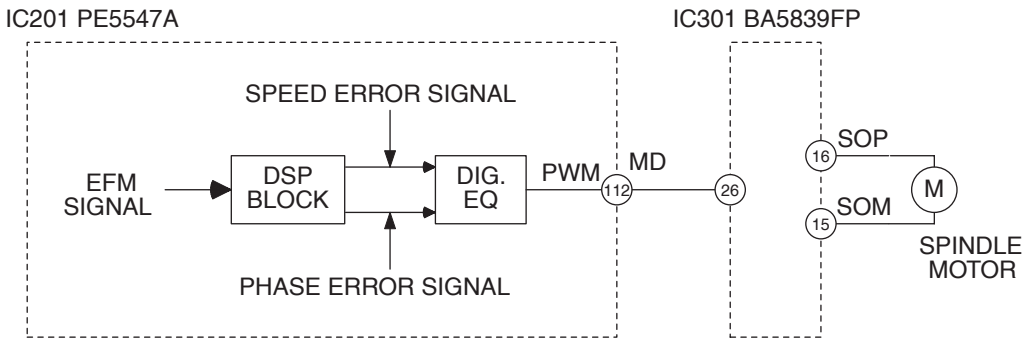


Fig.1.2.9 Block diagram of the spindle servo system

1.3 AUTOMATIC ADJUSTMENT FUNCTION

In this system, all the circuit adjustments are automated inside the CD of the LSI.
All adjustments are performed whenever a disc is inserted or the CD mode is selected by pressing the source key.
Details of each adjustment will be explained below.

1.3.1 TE, FE, and RF offset auto-adjustment

In this adjustment the TE, FE, and RF amplifier offsets of the preamplifier block in POWER ON are adjusted to the respective target values with the REFO as reference. (The target values for TE, FE, and RF offsets are 0 V, 0 V, and - 0.8 V, respectively.)

Adjusting procedure

1) The CPU of the LSI reads respective offsets through the CD of the LSI, when they are in LDOFF status.
2) The CPU of the LSI calculates the voltages for correction from the values read in 1), and substitutes the corrected values to prescribed places to adjust.

1.3.2 Tracking balance (T.BAL) auto-adjustment

This adjustment equalizes the output difference of the E-ch and F-ch from the pickup by changing the amplifier gain inside the CD of the LSI. In actual operation, adjustment is performed so that the TE waveform becomes symmetrical on each side of the REFO.

Adjusting procedure

1) After closing the focus loop,
2) Kick the lens in the radial direction to ensure the generation of the TE waveform.
3) The CPU of the LSI reads the offset amount of the TE signal calculated in the LSI at the time through the CD of the LSI.
4) The CPU of the LSI determines the offset amount is 0, positive, or negative.
- When the offset amount is 0, the adjustment is completed.
- When the offset amount is positive or negative, the amp gains for E-ch and F-ch should be changed, following a certain rule.

Then, steps 2) to 4) are repeated until the offset amount becomes 0 or the repetition reaches the limit number of times.

1.3.3 FE bias auto-adjustment

This adjustment is to maximizes the RFO level by optimizing the focus point during the play mode, utilizing the phase difference between the 3T level waveform of the RF waveform and that of when focus error disturbance is input. This adjustment is performed at the same timing as the auto-gain control, which will be described later, since disturbance is input to the focus loop.

Adjusting procedure

1) The CPU of the LSI issues the command to introduce disturbance to the focus loop (inside the CD of the servo LSI).
2) The waver of the 3T component of the RF signal is detected in the CD of the LSI.
3) The relation between the 3T component above and the disturbance is processed inside the CD of the LSI to detect the volume and direction of the focus offset.
4) The CPU of the LSI issues a command and reads out the detected results from the CD of the LSI.
5) The CPU of the LSI calculates the necessary correction and substitutes the result to the bias adjustment term inside the CD of the LSI.

Additionally, in this adjusting, a series of steps are repeated for better adjustment accuracy, the same as in the auto-gain control.

1.3.4 Focus and tracking AGC

This adjustment is to automatically adjust the focus and tracking servo loop gains.

Adjusting procedure

1) Introduce disturbance to the servo loop.

2) The error signals (FE and TE) when disturbance is introduced are extracted through the band pass filter, to obtain the G1 and G2 signals.

3) The CPU of the LSI reads the G1 and G2 signals through the CD of the LSI.

4) The CPU of the LSI calculates the necessary correction and performs the loop gain adjustment inside the CD of the LSI.

For increased adjustment accuracy, the same adjustment process is repeated a few times.

1.3.5 RF level auto-adjustment (RFAGC)

This adjustment is to adjust the dispersion of the RF level (RFO), which may be caused by mechanism or disc-related factors, to a steady value for reliable signal transmission. The adjustment is performed by changing the amp gain between RFO and RFAGC.

Adjusting procedure

1) The CPU of the LSI issues a command and reads out the output from the RF level detection circuit inside the CD of the LSI.

2) From the read values, the CPU of the LSI calculates the amp gain to change the RFO level to the target.

3) The CPU of the LSI sends a command to the CD of the LSI to adjust the amp gain to the level calculated in 2).

This adjustment is performed

1) when only the focus close operation is completed during the setup mode, and

2) immediately before the setup is completed (or when the play mode is about to start).

1.3.6 Adjustment of gains in preamplifier stage

In this adjustment, when reflected beams from the disc surface are extremely weak, such as when the lens is dirty, or a CD-RW is played, gains in the whole RFAMP block (FE, TE, and RF amplifiers) are increased by + 6 dB or + 12 dB, depending on the situation.

Adjusting procedure

When the system determines that the reflected beams from the disc surface are extremely weak during the setup mode, the whole RFAMP gains will be increased by + 6 dB or + 12 dB.

1.3.7 Initial values in adjustment

All automatic adjustments immediately after inserting a disc are performed based on the initial values. Automatic adjustments by source change or ACC ON are basically performed using the previous adjustment values as the initial values.

1.3.8 Coefficient display of adjustment results

For some of the adjustments (FE and RF offset, FZD cancel, F and T gains, and RFAGC), the adjustment results can be displayed and confirmed in the test mode.

The coefficient display in each auto adjustment is as follows:

1) FE and RF offset

Reference value = 32 (coefficient of 32 indicates that no adjustment is required)

The value is displayed in the unit of approximately 32 mV.

Ex. When the FE offset coefficient is 35,

35 - 32 = 3 x 32 mV = 96 mV

The correction is about +96 mV, which means the FE offset before adjustment is - 96 mV.

2) F and T gain adjustment

Reference value for focus and tracking = 20

The displayed coefficient / the reference value indicates the adjusted gain.

Ex. When the AGC coefficient is 40,

adjustment of 40 / 20 = 2 times (+ 6 dB) has been performed.

(It means that the original loop gain was half the target, and the whole gain was doubled to obtain the target value.)

3) RF level adjustment (RFAGC)

Reference value = 8

The coefficient of 9 to 15 indicates to increase the RF level

(for more gains).

The coefficient of 7 to 10 indicates to decrease the RF level

(for less gains).

When the coefficient changes by 1, the gain changes by 0.7 to 1 dB.

When the coefficient is 15, the gain is the maximum at TYP + 7.9 dB.

When the coefficient is 0, the gain is the minimum at TYP - 4.6 dB.

1.4 POWER SUPPLY AND LOADING BLOCK

For the power supply for this system, the VD (7.5 ± 0.5 V) and the VDD (3.3 ± 0.165 V), which are supplied from the motherboard, are used. The two power supplies, the VD mentioned above (for the drive system), and the VDD (for the LSI: 3.3 V), are used in this system.

The CPU of the LSI controls ON/OFF with "CONT", except for Load/Eject of the CD driver. For ON/OFF of the Loading drive, no particular control terminals are available, but the input signal "LOEJ" assumes an equivalent role. Also, the LCO output switches LOADING MODE and CARRIAGE MODE with "CLCONT".

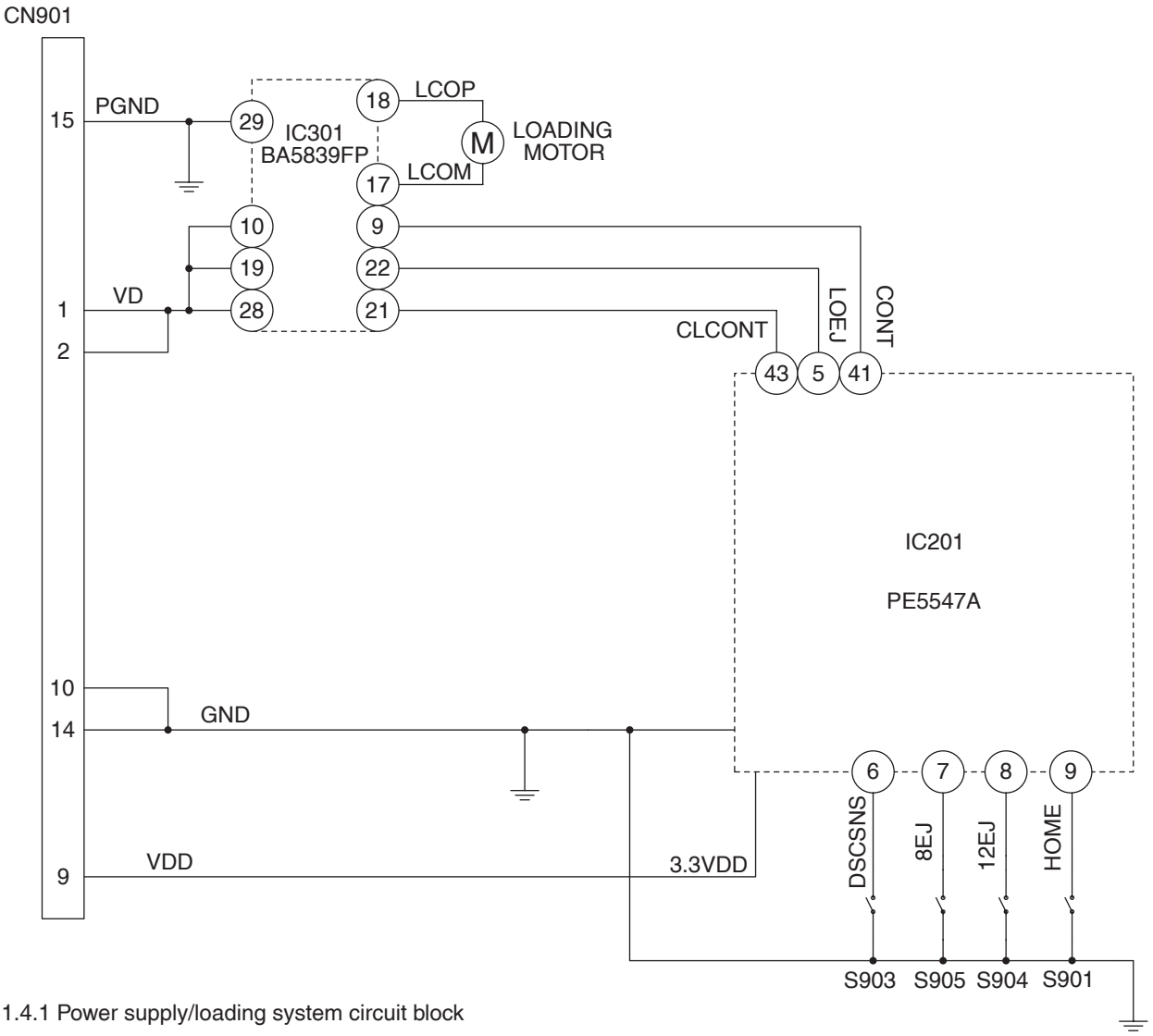


Fig.1.4.1 Power supply/loading system circuit block

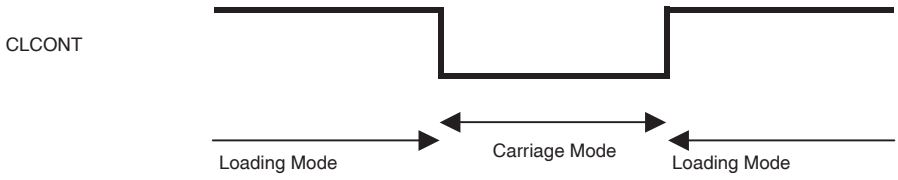


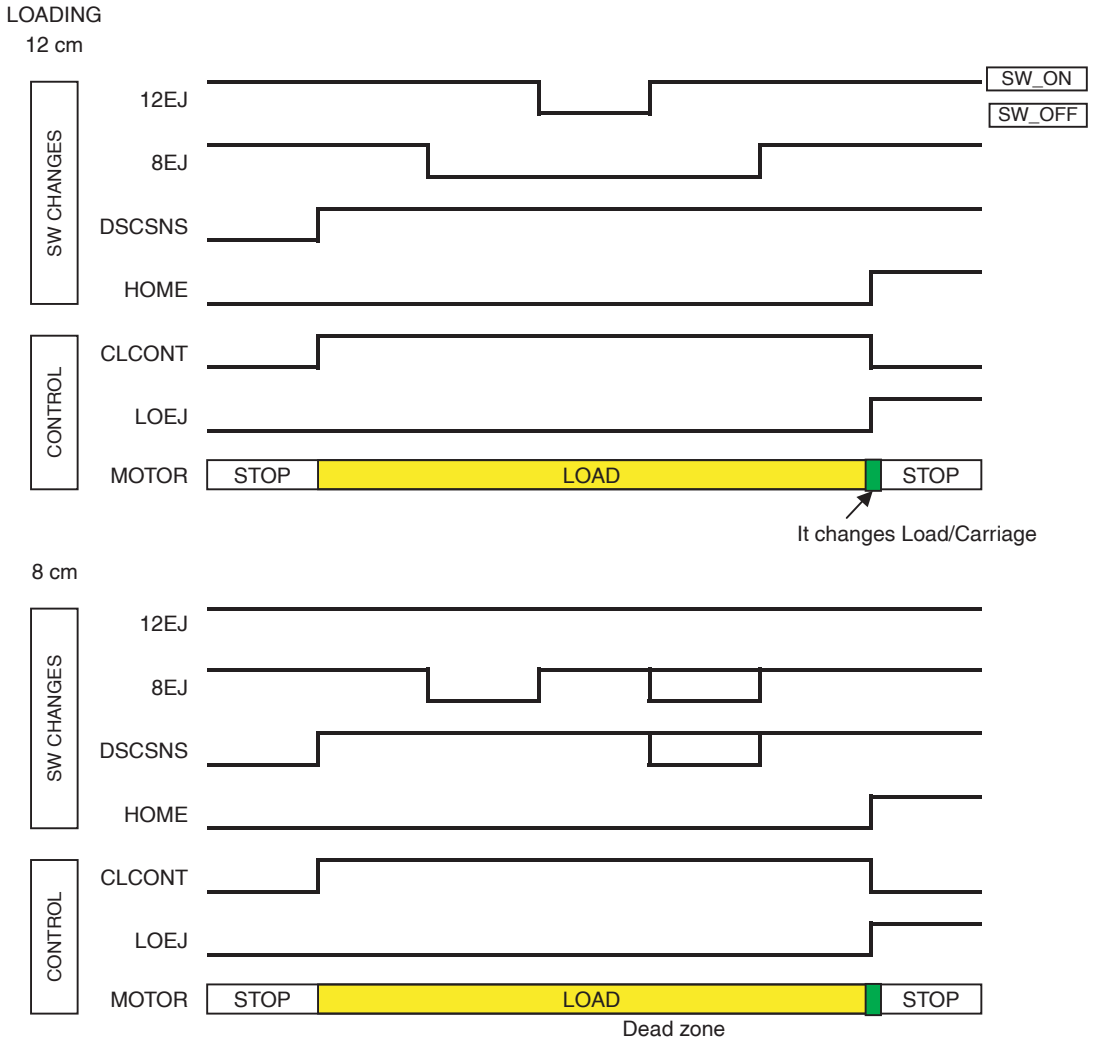
Fig.1.4.2 Loading/carriage mode shift

The load/eject operation is controlled with the status changes of the HOME switch (also used for clamp detection) on the mechanism unit and the three switches on the control unit. The ON/OFF statuses of these switches are respectively detected at the input port of the microcomputer.

Using the detection results in the microcomputer, each status (A to E) is determined. The disc size detection (8 or 12 cm) is also performed through this status change. Each status is shown in Fig.1.4.3 and the status change in Fig.1.4.4.

	Status	A	B	C	D	E
DSCSNS	SW1(S903)	OFF	ON	ON	ON	ON
8SW	SW2(S905)	ON	ON	OFF	OFF	ON
12SW	SW3(S904)	ON	ON	ON	OFF	ON
HOME	SW4(S901)	OFF	OFF	OFF	OFF	ON
	Mechanism state	With no disc				Clamp state

Fig.1.4.3 DSCSNS status



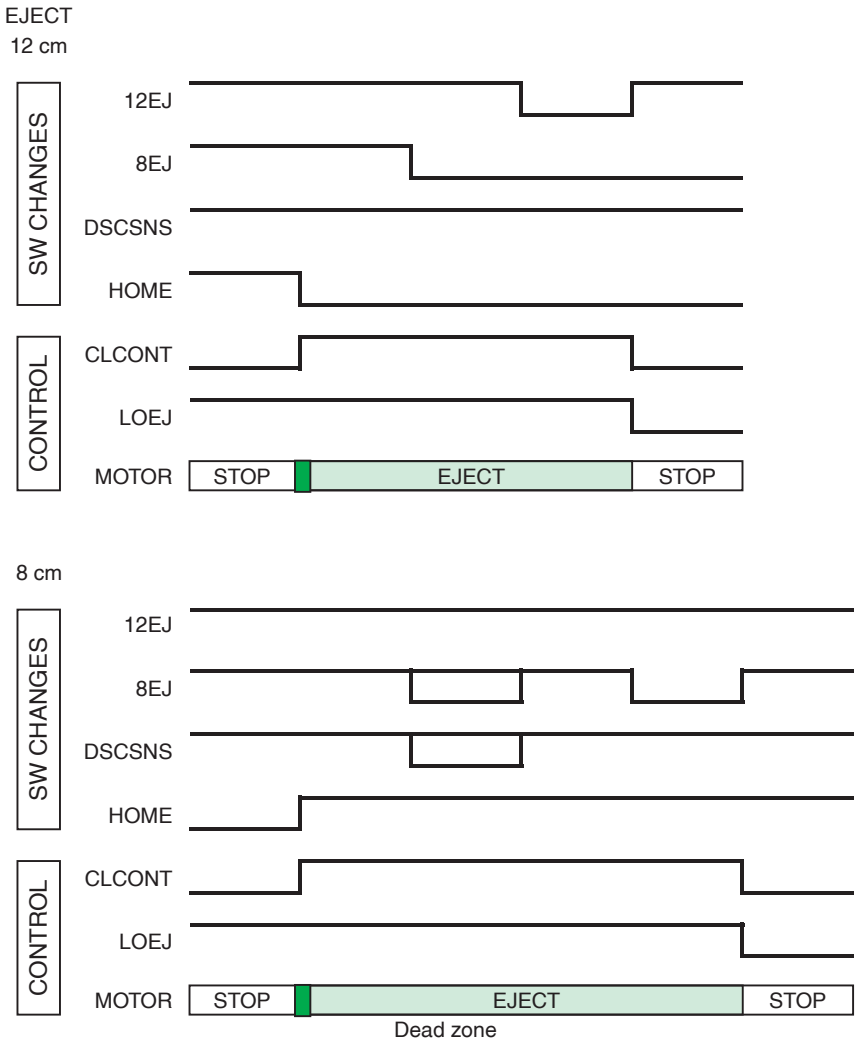
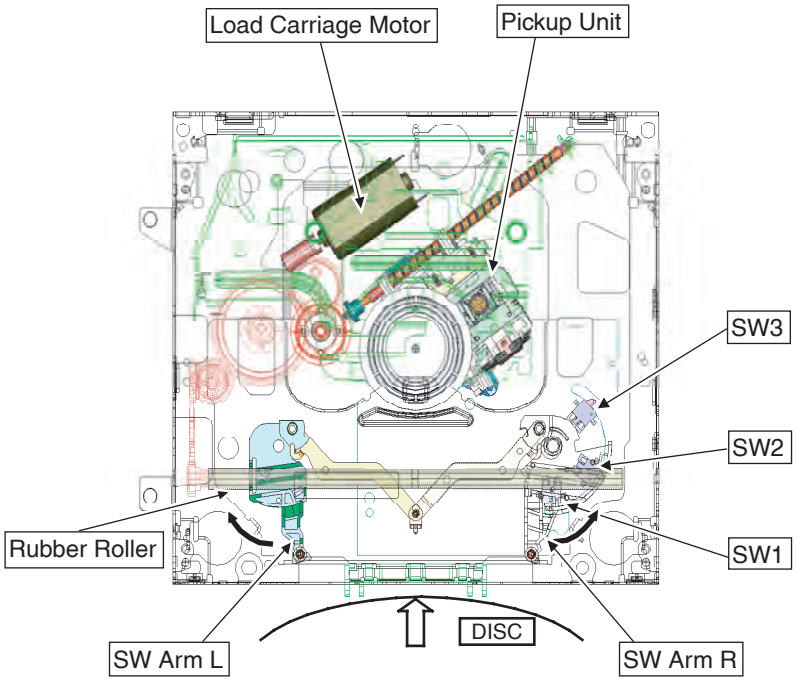


Fig.1.4.4 Status change in LOAD and EJECT modes

2. MECHANISM DESCRIPTIONS

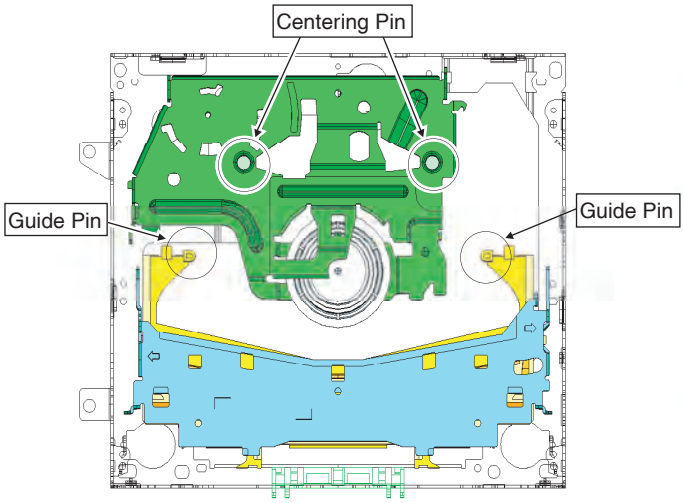
● Loading actions

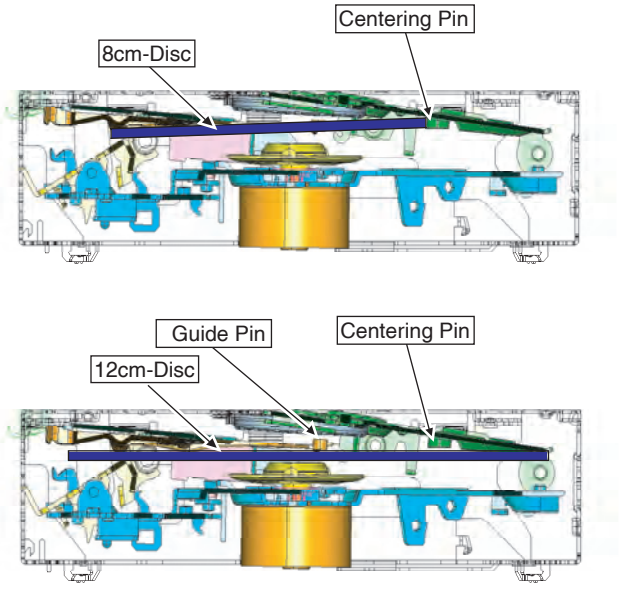
1. When a disc is inserted, SW Arm L and R rotate and SW1 is switched from ON to OFF.
   When SW1 is switched from ON to OFF, the Load Carriage Motor is started and the rubber roller rotates.
2. If the disc is a 12cm-disc, SW3 is turned ON with SW Arm, and the microcomputer determines that the disc is a 12cm-disc.
3. In case of an 8cm-disc, SW3 is not turned ON, a clamp action is triggered, and the microcomputer determines that the disc is an 8cm-disc.
   (The left and right of SW Arm are coupled, and when only one side is pushed, the coupled joint will lock, and the arms will not open more than a certain width (SW3 will not be turned ON).)



● Disc centering mechanism

1. 8cm-disc is centered by the Guide Pins and the Centering Pins.
2. 12cm-disc passes under the Guide Pins and the Centering Pins, and centered in the back position of the mechanism.





● Clamp actions mechanism

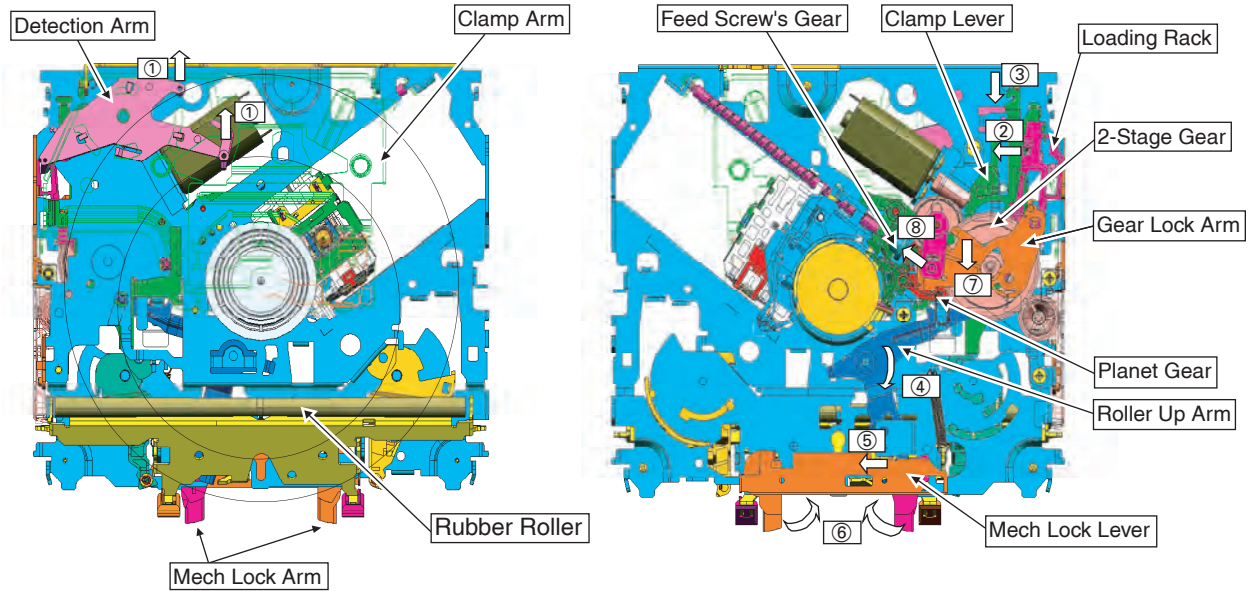
1. With an 8 or 12cm-disc centered on the spindle, the Detection Arm is moved.
2. The movement of the Detection Arm engages the Loading Rack with the 2-Stage Gear.
3. The Clamp Lever slides and lowers the Clamp Arm (the disc is clamped).

At the same time, the Roller Up Arm is rotated, and the Rubber Roller is separated from the disc.

Also the arm slides the Mechanical Lock Lever, turns the Mechanical Lock Arm, and releases the mechanical lock, completing the clamp operation.

4. When the clamp action is completed, the Clamp Lever rotates the Gear Lock Arm.

When the arm is rotated, the Planet Gear is separated from the 2-Stage Gear and engaged with the gear of the pickup feed screw, and the carriage operation will start



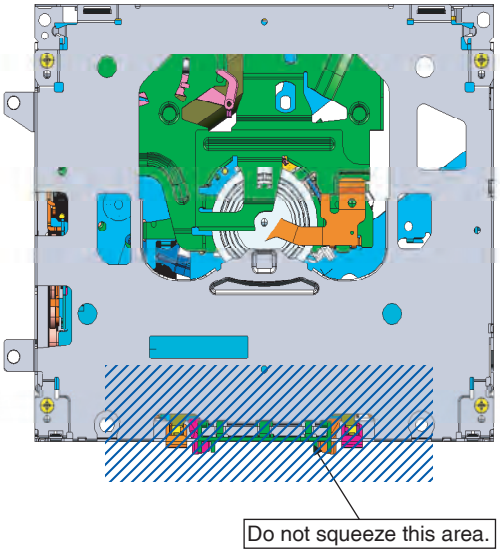
● Eject actions

1. When the Load Carriage Motor is rotated backward, and the pickup is fed to the inner periphery passing the home SW ON point, the eject action will start in the reverse order of the procedure mentioned earlier.
2. For a 12cm-disc, Eject is completed when SW3 is switched OFF, ON, and OFF again.
3. For an 8cm-disc, Eject is completed when SW2 is switched OFF, ON, and OFF again.

3. DISASSEMBLY

● How to hold the Mechanism Unit

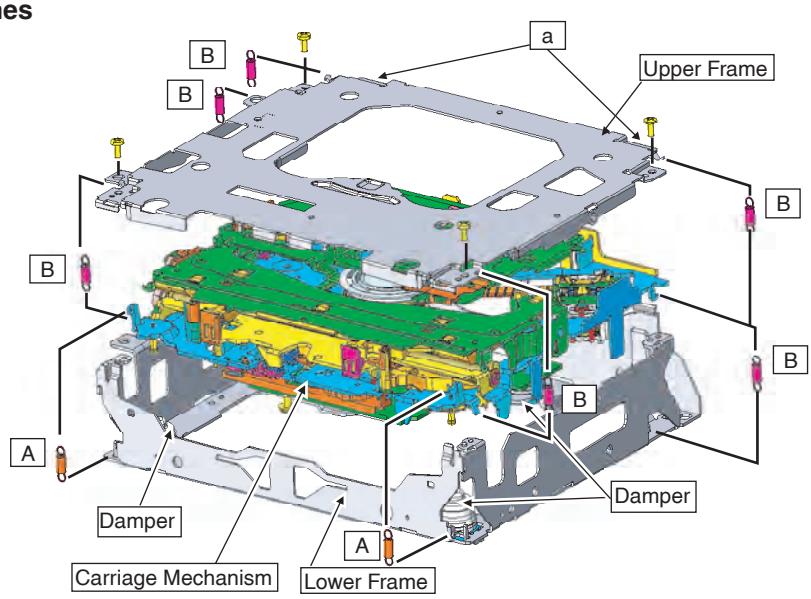
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

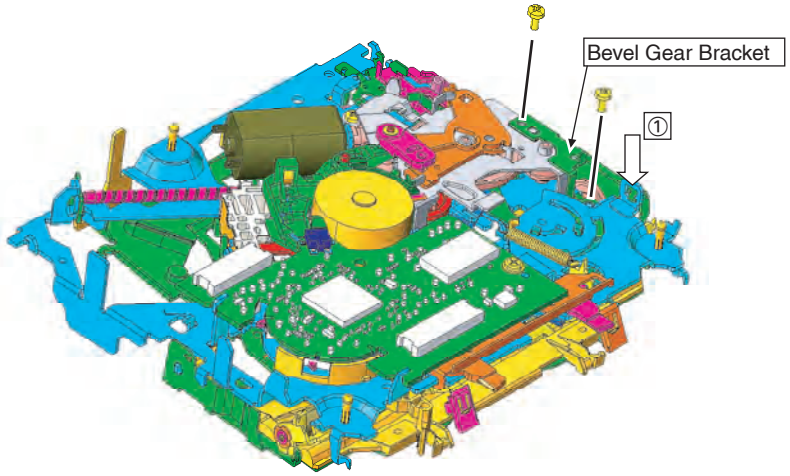
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.

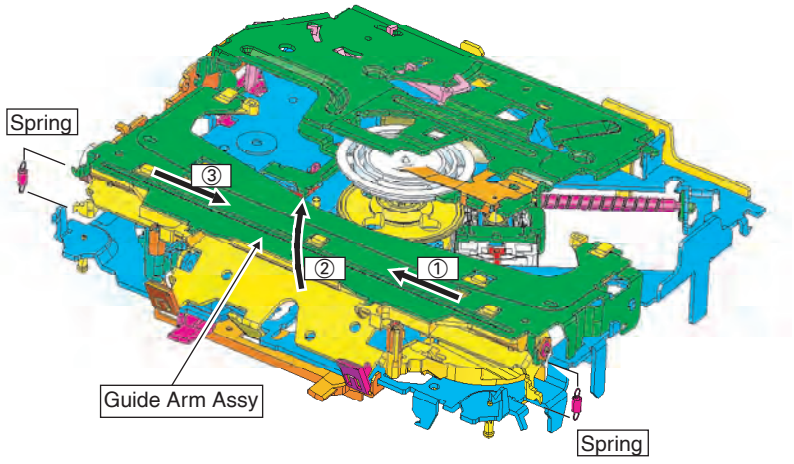


● Removing the Guide Arm Assy

1. Remove the Upper and Lower Frames and set the mechanism to the eject mode.
2. Remove the two Screws and Bevel Gear Bracket. (Note that the gears will come off.)
3. Remove the two Springs from the left and right sides.
4. Slide the Guide Arm Assy to the left, and turn it upward.
5. When it is turned about 45 degrees, slide it to the right and remove.

Caution: When assembling, assemble with the Bevel Gear Bracket moved to the direction of the arrow (①).

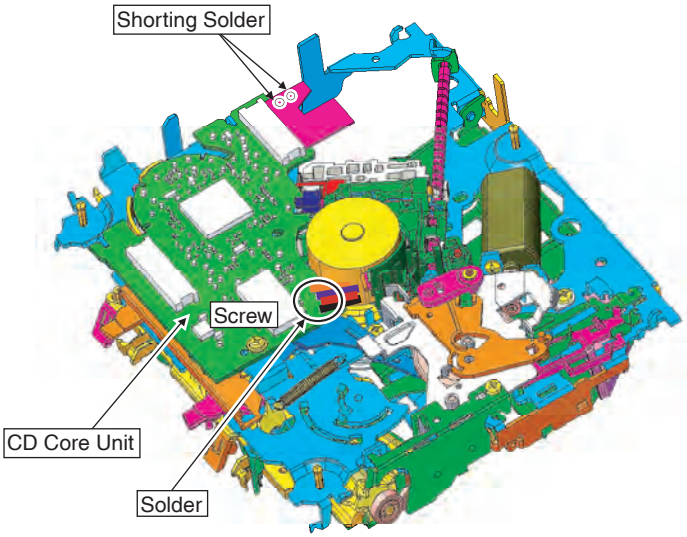




● How to remove the CD Core Unit

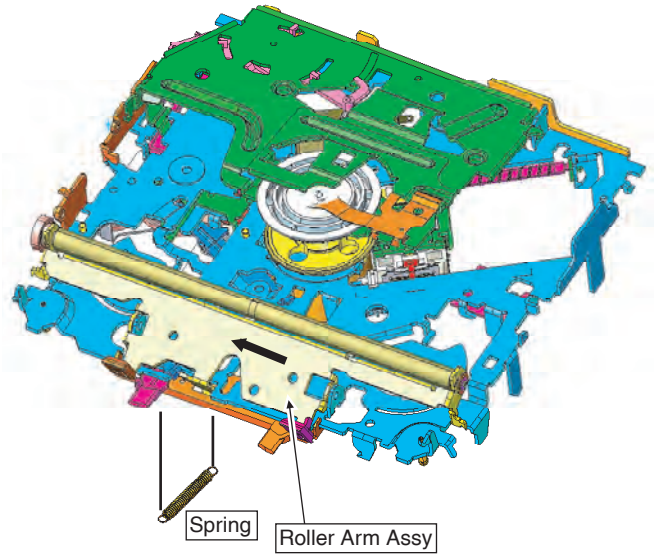
1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

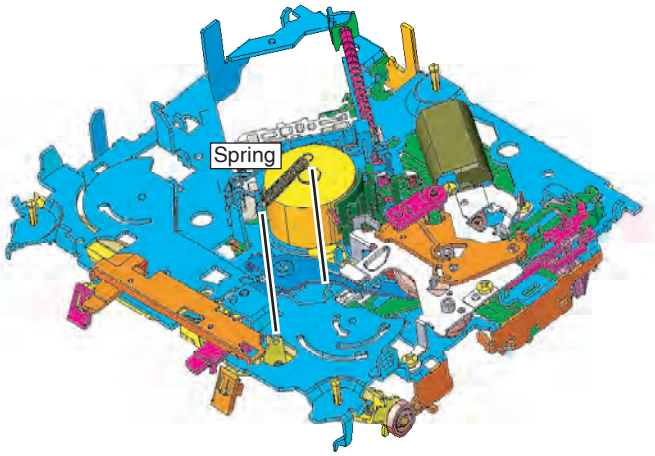
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



● How to remove the Roller Arm Assy

1. Remove the Guide Arm Assy.
2. Remove the CD Core Unit. (If the Spring can be removed, the unit need not be removed, depending on the type of CD Core Unit.)
3. Remove the Spring.
4. Slide the Roller Arm Assy to the left.



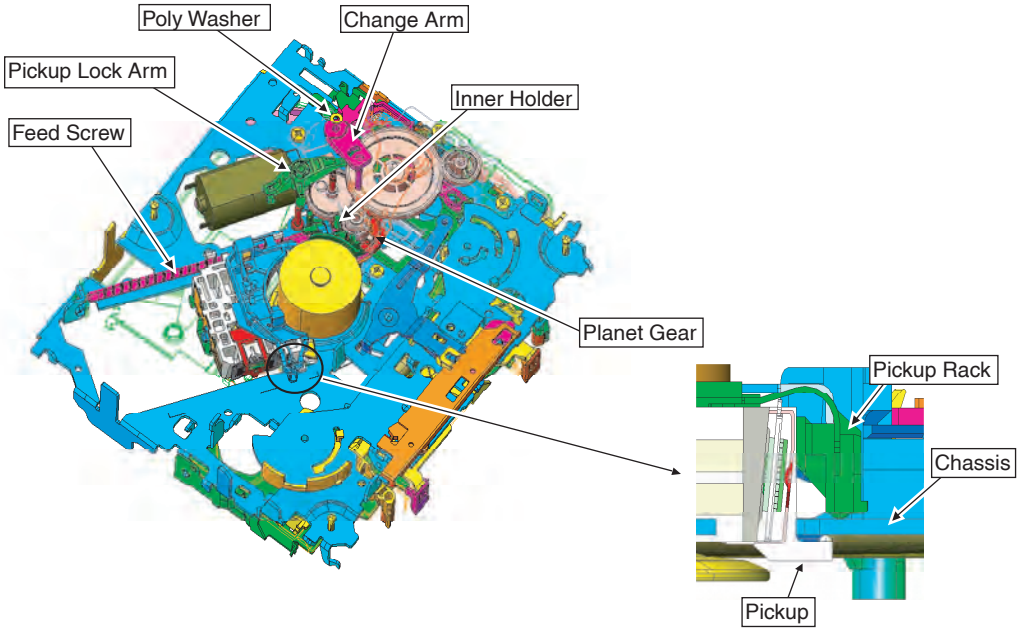


● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.

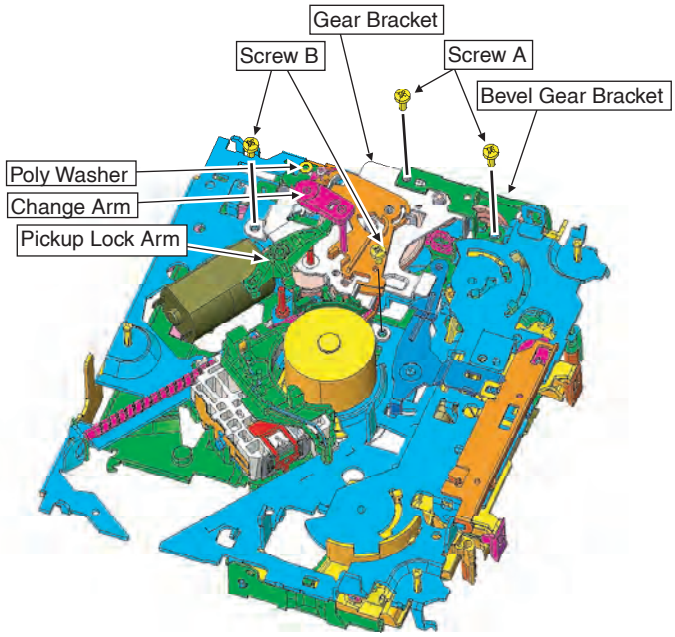
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.

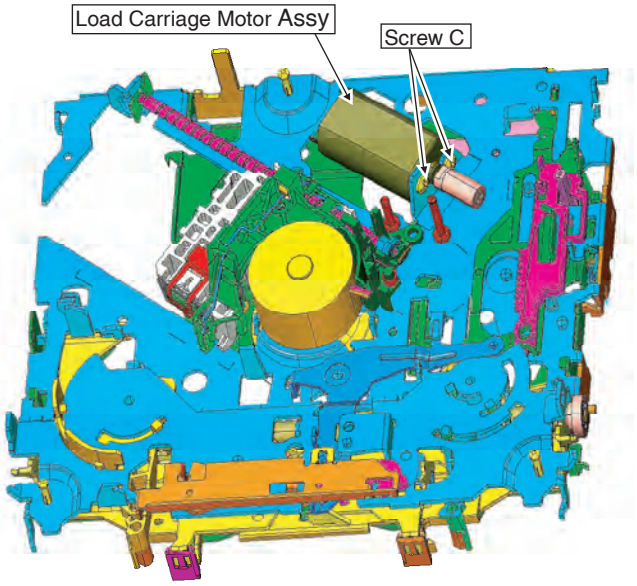


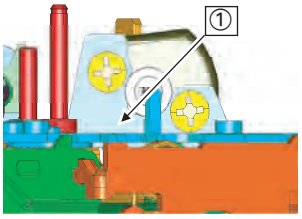
● How to remove the Load Carriage Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Release the leads (orange and purple) of Load Carriage Motor Assy from the CD Core Unit and remove the holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. Remove the two Screws (A) and the Bevel Gear Bracket (Note that the gears will come off).
5. Remove the two Screws (B) and the Gear Bracket (remove the CD Core Unit, if necessary), and remove all the gears.
6. Remove the two Screws (C) and the Load Carriage Motor Assy.

Caution: When assembling the Load Carriage Motor Assy, move it to the direction shown in the illustration (①).
When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



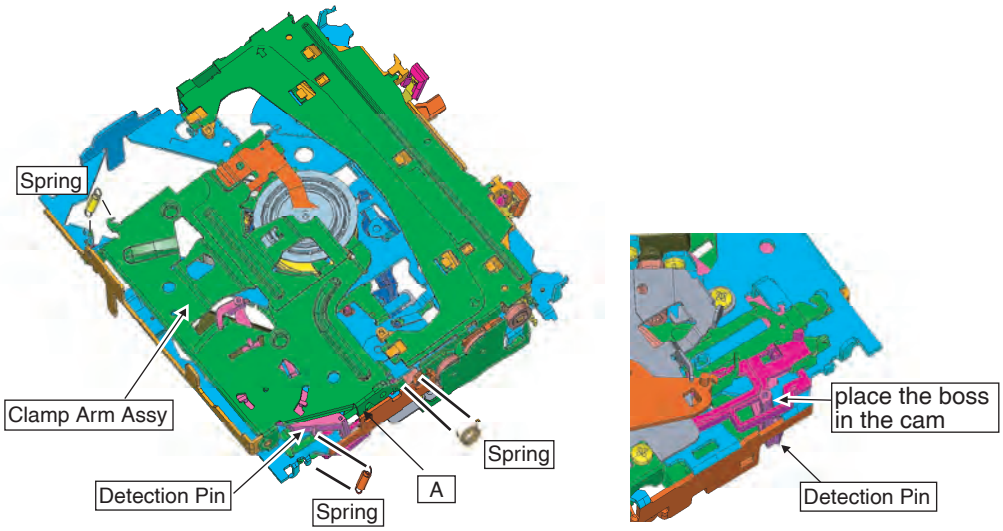




● How to remove the Clamp Arm Assy

1. Make the system in the carriage mechanism mode, and set the mechanism to the eject mode.
2. Remove the three Springs.
3. While pressing the position A, turn the Clamp Arm Assy upward, slide it to the left, and remove.

Caution: When assembling, place the boss of the Detection Pin in the cam unit of the Loading Rack.



● How to remove the Spindle Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Set the mechanism to the eject mode and remove the Clamp Arm Assy.
4. Set the mechanism to the clamped and move the Pickup to circumference.
5. Remove the two Screws, and remove the Spindle Motor Assy.